

Desiderata in our Knowledge of New England Birds.

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This is a preliminary report of the Committee of the Nuttall Ornithological Club and is designed to serve the members as a guide in their field work during the ensuing summer.

The following questions will apply, with a few obvious exceptions, to all of our birds, and especial attention is called to them; — Conditions governing local distribution? — The order in which the ages and sexes follow in the Spring and Autumn migrations? — Do both sexes build? — Duration of construction of the nest? Duration of the laying period? — Duration of incubation? — Do both sexes sit? — Period during which the young remain in the nest? — Roosting habits? — Does the species pair for life? — To what age does the species live? Dates of migration west of the Connecticut valley?

The following is a list of species with the desiderata especially applicable to them.

Grey-cheeked Thrush. Breeding range? Feeding habits and song?

Bicknell's Thrush. What is its distribution on the mountains of Maine? Exact limit of its distribution on the Green Mountain range of Vermont? Time of arrival on breeding grounds? Nest and eggs? (more information and specimens). Time of departure from breeding grounds? Food?

Mocking Bird. Time of year and time of day of migration?

Ruby-crowned Kinglet. Breeding limits, including range in altitude?

Golden-crowned Kinglet. Number of broods?

Hudsonian Chickadee. Southern limits of breeding range? Southern winter range? Number of broods? Feeding habits and song?

White-breasted Nuthatch. Northern breeding limit? Up to what altitude do they breed? Are the Spring and Autumn migration routes different? How early do the birds ever appear in autumn or summer? How late in Spring do the migrants linger? At what time in Autumn are they most abundant? At what time in Spring? How many broods do they raise in New England? Do they utter their note on the wing? Do they catch insects on the wing? Do they store food? Do they ever sleep head down?

Red-breasted Nuthatch. Northern breeding limit? Number of broods? Have they a courtship or breeding note? If so, how early in Spring and how late is it heard? Do they roost with their heads down?

Brown Creeper. Number of broods?

Winter Wren. Migration routes? Is there a flight song?

Short-billed Marsh Wren. At what points north of Massachusetts is it found breeding? Is any migration through Massachusetts perceptible in Spring or Fall? What kinds build the extra nests? What purpose?

does the empty nest serve? Are they built by breeding or non-breeding birds? or by both? How soon after reaching their breeding grounds do they commence building these nests and how late in summer do they continue? Origin of the habit? Do they lay a second time before the first brood has flown?

Long-billed Marsh Wren. Number of broods? Same questions concerning extra nests as above?

Water Thrush. Is there a flight song?

Blue-headed vireo. If the male incubates, does he, (as do some other vireos), sing while on the nest? When do the summer residents in Rhode Island and Connecticut leave for the south?

Lincoln's Sparrow. It seems highly probable that this bird breeds in New England. It is most desirable to establish this and the bird should be carefully looked for in the summer along the coast of Maine and the more northern parts of Maine, New Hampshire and Vermont, as well as in the higher New England mountains. Records of migration in middle and western New England? Breeding habits? Song?

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Introduced Game Birds in Oregon and ~~Idaho~~.—Several years since our consul to Japan sent over quite a number of Japanese Pheasants—exact species to me unknown. The birds were liberated below Portland, Oregon, on Sanvie's Island, and are known to have bred. While on duty at Vancouver Barracks I met a gentleman who informed me that he had seen, not long before (the summer of 1883), an old bird with several young near where the Pheasants were first liberated. In the autumn of 1883 a female was killed just below Vancouver. I saw this one, and the skin is now in the possession of Mr. John Jaggyat. The bird killed was one of a pair seen flying across the Columbia from the Oregon side to Washington Territory. The river at this point is nearly a mile wide, and the point of crossing was at least fifteen miles above the place of *planting*. By this it appears that the 'plant' has been established. The bird is a strong flier and bids fair to be a valuable acquisition. Oregon and Washington Territory have passed laws protecting these birds.

Timothy E. Wilcox, Ass. Surg. U. S. A.

Auk, 2, July, 1886, p. 315.

NEW ENGLAND.

1860-61 Allen, J. A. *The Birds of New England* 173 articles
in *New England Farmer* (the mag. book)

✓ 1865. Samuels, E. A. Oölogy of some of the Land Birds of New England, as a means of identifying injurious or beneficial species. Rep. U. S. Agric. Dept. for 1864, pp. 386-430.
(See also Ibid, 1867, pp. 201-208.)

✓ 1867. Samuels, E. A. Ornithology and Oölogy of New England. Containing full description of the birds of New England, and adjoining States and Provinces, arranged by a long-approved classification and nomenclature; together with a complete history of their habits, times of arrival and departure, their distribution, food, song, time of breeding, and a careful description of their nests and eggs; with Illustrations of many species of the Birds, and accurate Figures of their Eggs. Boston: Nichols and Noyes, 117 Washington Street. 1 Vol. 8vo. pp. VII, 583.

Several subsequent editions with slight additions, the last issued in

✓ 1868. Combs, Elliot. Catalogue of the Birds of North America contained in the Museum of the Essex Institute; with which is incorporated a List of the Birds of New England. With Brief Critical and Field Notes. Proc. (Comm.) Essex Inst., V, pp. 249-314.

An annotated list of 335 New England Species.

✓ 1875. Brewer, J. M. Catalogue of the Birds of New England, with brief notes indicating the manner and character of

their Presence; with a List of Species included in previous Catalogues believed to have been wrongly classed as Birds of New England. Proc. Bost. Soc. Nat. Hist., XVII, pp. 436-454. Enumerates 336 Species.

(See also review in Bull. N.O.C., I, 1876, pp. 72-73; and ^{Discussion} ~~description~~ of the same in Ibid., pp. 89-93; II, 1877, pp. 11-17, 44-48.)

1876. Brewster, Wm. On the Occurrence of Certain Birds in the New England States. Bull. N.O.C., I, pp. 17-20. Notes on 5 Species.

1877. Minot, H. D. The Land-Birds and Game-Birds of New England, with Descriptions of the Birds, their Nests and Eggs, their Habits and Notes. Salem, Mass.: Naturalists' Agency. Boston: Estes and Lauriat. 1 Vol. 8vo. pp. XVI, 459 wood cuts.

Possesses some admirable features not included in other works on New England Birds.

(See also a review in Bull. N.O.C., II, 1877, p. 49 and note by author in Am. Nat., XI, 1877, p. 175.)

1877. Purdie, H. A. Notice of a few Birds of rare or accidental Occurrence in New England. Bull. N.O.C., II, pp. 20-22. Notes on 14 Species.

1878. Brewer, T. M. Notes on certain species of New England Birds, with Additions to his Catalogue of the Birds of New England. Proc. Bost. Soc. Nat. Hist., XIX, pp. 301-309.

'Adds 21 species to same author's 'Catalogue' of 1875'

and contains notes on 27 other species of rare occurrence in New England."

(Review in Bull. N.O.C., III, 1878, p. 185.)

1879. Brewer, T. M. Some additional notes upon Birds observed in New England, with the Names of Five Species not included in his Previous Lists of New England Birds. Proc. Bos Soc. Nat. Hist., XX, pp. 263-277.

Notes on 40 Species. (See also a review in Bull. N.O.C. V, 1880, pp. 108-109.)

1879. Brewer, T. M. Notes on New England Birds. Bull. N.O.C., IV, pp. 63, 64.

Notes on 7 Species.

1879. Brewster, William. The Terns of the New England Coast. Bull. N.O.C., IV, pp. 13-22.

On 11 Species.

1881-3. Stearns, Winfrid A., and Coues, Dr. Elliot. New England Bird Life, being a Manual of New England Ornithology, revised and edited from the manuscript of Winfrid A. Stearns by Dr. Elliot Coues, U.S.A. Part I, Oscines. Boston, Lee and Sheppard, Publishers. New York, Charles T. Dillingham, 1881, 8vo. pp. 324, numerous wood cuts. Part II, Monoscine Passeres, Birds of Prey, Game and Water Birds. 1883, 8vo. pp. 409. 88 Wood cuts.

Descriptions and biographies of New England Birds.

(See also reviews in Bull. N.O.C. VI, 1881, pp. 236-240; VIII, 1883, pp. 161-164.)

1884. Collins, Capt. J. W. Notes on certain Laridae and Procellariidae of the New England Coast. The Auk, I, pp. 236-238.

Extended notes on a dozen Species.

1884. Collins, Capt. J. W. Notes on the Habits and Methods of Capture of various species of Sea Birds that occur on the Fishing Banks off the Eastern Coast of North America, and which are used as bait for catching Cod-fish by New England Fishermen. Am. Rep. of the Comm. of Fish and Fisheries for 1882, pp. 311-338, pl. i. The Auk, I, pp. 380.

1886. Capen, E. A. Ornithology of New England: a description of the Eggs, Nests and Breeding Habits of the Birds known to breed in New England, with colored illustrations of their Eggs. Boston, Alfred Mudge and Son, Printers, 24 Franklin Street. 4to., pp. 116, pl. XXV.

(See also review in Auk, III, 1886, P. 400.)

1887. Newcomb, Raymond Lee. Sea Bird notes of the Grampus. Forest and Stream, XXVIII, pp. 152, 153.

Based on observations made off the New England Coast from Sept. 23 to Oct. 14.

CONNECTICUT.

1843. Linsley, J. H. A Catalogue of the Birds of Connecticut, arranged according to their natural families. Am. Journ. Sci. and Arts, XLIV, pp. 249-274.

Enumerates 302 species including those presumed to occur
(See also additions and corrections Ibid., XLVI, 1844, pp. 50
51.)

1861. Wood, W. (Rapacious) Birds of Connecticut.
Hartford Times (newspaper) March 16, 23, 30, April 13, 20,
May 4, 11, 18, 25, June 1, 8, 15, 22, 29, July 6, 20, 27,
August 10, 17, 24, 1861.

1876. Morris, Robt. T. Game Birds of Connecticut.
Forest and Stream, VII, p. 116. (See also p. 276.)

Brief notes on 53 Species.

1877. Merriam, C. Hart. A Review of the Birds of Con-
necticut, with Remarks on their Habits. Trans. of the Conn.
Acad., IV, pp. 1-165.

A fully annotated list of 292 Species.

1878. Sage, John H. Birds of the Garden and Orchard.
Fam.Sci. and Fanc.Journ., V, pp. 50-51.

On species observed by the writer at Portland, Conn.

1878-9 Several articles by J.M.W. see Scrap books

1878-79. Wood, William, M.D. The (Rapacious) Birds of
Connecticut. Fam. Sci. and Fanc. Journ., V, 1878, pp. 6, 7,
26-28, 49, 50, 73, 75, 93, 94, 111, 132-134, 151-155, 171, 172
191-192, 210, 211, 226, 227; VI, 1879, pp. 1-3, 21, 22, 37,
38, 57, 58, 76, 78.

1881. Holbrook, S. T. Notes from Norwich, Conn. Orn.
and O61., VI, pp. 30-32.

Desultory notes on a number of species.

(I have only a
fragment of this
to two pages)

1881. Minot, H. D. Notes on the Migrations of Birds.
Am. Nat., XV, pp. 870-872.

Based on observations made at Litchfield, Conn.

1881. J. M. W. = (C. L. Rawson.) The Season of '81.
Orn. and Oö1., VI, pp. 37, 38.

On the nesting of certain Raptores at Norwich, Conn.

1881. J. M. W. = (C. L. Rawson). Close of the Season.
Orn. and Oö1., VI, pp. 54, 55.

Notes from Norwich, Conn.

1882. Sage, John H. (Arrival of Birds in Spring at
Portland, Conn.) Forest and Stream, XVIII, p. 305.

Notes on 21 Species.

1883. Goff, J. L. Nesting Notes from (Gildersleeve,) Connecticut. Orn. and Oö1., VII, p. 78.

Notes on 9 Species.

1883. J. M. W. = (Rawson, C. L.) Among the Buteos. Orn
and Oö1., VIII, pp. 17, 18. (See also p. 85.)

Notes from Norwich, Conn.

1884. J. M. W. = (Rawson, C. L.). Migration and Breed-
ing Notes. Orn. and Oö1., IX, pp. 68, 69.

Notes from Norwich, Conn.

1885. J. M. W. = (Rawson, C. L.). Orn. and Oö1., X, pp.
24, 25. (See also p. 89.)

Notes from Norwich, Conn. on 9 Species.

1887. Platt, Franklin. A List of the Birds of Meriden,
Conn. Trans. Meriden Scientific Assoc., II, 1885-86, pp.

A briefly annotated list of 116 Species.

1889. Bishop, Louis B., M.D. *Helminthophila pinies*, H. Chrysoptera, H. leucobronchiatae and H. lawrencei in Connecticut in the Spring of 1888. Auk, VI, 1889, pp. 192, 193.
(See also Eames, Ibid., pp. 305-310.)

1889. Platt, Franklin. A Supplementary List of the Birds of Meriden, Conn.

Trans. Meriden Sci. Assoc. III, p. 41.

1891. J. M. W. = (Rawson, C. L.) The Birds of Long Point. Orn. and Oö1., XVI, pp. 59-61.

Notes from "Groton, Long Point, New London, Conn."

1892. Averill, C. K. Jr. List of Birds found in the Vicinity of Bridgeport, Connecticut. Prepared for the Bridgeport Scientific Society, Bridgeport, Conn. Buckingham and Brewer, Printers. 8vo. pp. 1-19.

A briefly annotated list of 246 Species.

MASSACHUSETTS.

1833. Emmons, E. A. A Catalogue of the Animals and Plants of Massachusetts. II, Birds. Hitchcock's Rep. Geol. Min. Bot. and Zool. Mass., Amherst, 1833, pp. 545-551.

A briefly annotated list of 160 Species.

1834. Emmons, E. Observations on the time of the appearance of Spring Birds in Williamstown, in the years 1831, 1832 and 1833. Am. Journ. Sci. and Arts, XXVI, p. 208.

Notes on 23 Species.

1837. Brewer, T. M. Some additions to the Catalogue of the Birds of Massachusetts in Prof. Hitchcock's Report. *Journ. Bost. Soc. Nat. Hist.*, I, pp. 435-439.

Adds 45 Species.

1839. Peabody, W. B. O. Reports on the Fishes, Reptiles and Birds of Massachusetts. Boston: Dutton and Wentworth, State Printers. 1 Vol. 8vo. pp. XII, 426. A Report on the Ornithology of Massachusetts, pp. 255-404.

An annotated list of 205 Species.

(See *Journ. Bost. Soc. Nat. Hist.*, 1840, pp. 65-266.)

1846. Halder, J. B. Catalogue of Birds noticed in the Vicinity of Lynn, Mass., during the years 1844-5-6. Publications of the Lynn Natural History Society. No. 1. December. pp. 1-8. Republished by the Author as a Separate, in 1885.

A nominal list of 185 Species.

1856. Putnam, F. W. Catalogue of the Birds of Essex County, Mass. *Proc. Essex Inst.*, I, pp. 201-231.

A briefly annotated list of 235 + 10 accidental species known to have been found in the State but not in the County.

1864. Allen, J. A. Catalogue of the Birds found at Springfield, Mass., with Notes on their Migrations, Habits, etc.; together with a List of those Birds found in the State not yet observed at Springfield. *Proc. Essex Inst.*, IV, pp. 48-98.

An annotated list of 195 + 101 Species.

1864. Samuels, E. A. Ornithology of Massachusetts.
List of Species. Eleventh Ann. Rep. Sec'y Mass. Board of
Agric. for 1863. App. pp. XVIII-XXIX.

An annotated list of 267 Species.

1867. Allen, J. A. Ornithological Calendars. Am. Nat.
I, pp. 54, 109, 160, 161.

Calendars for March, April and May, based on observa-
tions made at Springfield, Mass.

1867. Allen, J. A. The Birds of Spring. Am. Nat., I,
pp. 141-144.

At Springfield, Mass.

1868. Allen, J. A. Winter notes of an Ornithologist.
Am. Nat., I, pp. 38-48.

On some winter birds of Massachusetts.

1870. Allen, J. A. Notes on some of the Rarer Birds of
Massachusetts. Am. Nat., III, pp. 505-519, 568, 585, 631-648.

A supplement to the same writer's Birds of Massachusetts
(cf. Bull. Essex Inst., 1865), raising the number of birds
therein recorded to 305.

1870. Brewer, T. M. Seaside Ornithology. Am. Nat. III
pp. 225-235.

Comments on changes in the fauna and notes on maritime
species.

1870. Maynard, C. J. Catalogue of the Birds of Eastern
Massachusetts, with notes relative to their migration, habits
etc.

The Naturalist's Guide, Part II, pp. 81-170.

An annotated list of 299 Species.

1872. Brewster, William. Birds new to Massachusetts Fauna. Am. Nat., VI, pp. 306,307.

Notes on 8 Species.

1873. Purdie, H. A. Notes on Some of the Rarer Birds of Massachusetts. Am. Nat., VII, pp. 692,693.

Based largely on the observations of J. N. Clark at Saybrook, Conn.

1875. Stearns, W. Birds Breeding on Penikese Island. Am. Nat. IX, pp. 514,515.

An Annotated list of 14 Species.

1876. Allen, J. A. Decrease of Birds in Massachusetts. Bull. N.O.C., I, pp. 53-60.

On birds now rare or unknown in the State.

1876. Allen, J. A. Ornithological Calendar for March (and April). Forest and Stream, VI, pp. 84, 116, 132.

Arrival and departure of migrant Species in latitude of Springfield, Mass. See also Am. Nat. I.

1876. Gray, Arthur F. Resident Birds of Danvers. Forest and Stream, VI, p. 181.

A list with brief notes, of 25 Species.

1876. Keyes, F. H. May Songsters at Springfield. Forest and Stream, VI, p. 238.

Nominal list of 68 Species.

1877. Browne, F. C. A list of Birds observed on and

around Clark's Island, Plymouth, Mass. Forest and Stream, VIII, p. 96.

A nominal list of 84 Species.

1878. Allen, J. A. A list of the Birds of Massachusetts, with Annotations. Bull. Essex Inst., X, pp. 3-37.

Enumerates 316 Species.

(See also a review in Bull. N.O.C., III, 1878, pp. 138-140.)

1878. Browne, F. C. Spring Migration of Birds. Forest and Stream, X, p. 76.

"Record (more or less full) of the spring arrival of 20 of the more common species in Framingham, for the last twenty-five years."

1878. Newcomb, R. L. Field notes (on Birds at Salem). The Country, I, p. 354. See also II, p. 152. *note on spring in of hummingbird*

1879. Browne, F. C. Notes on Arrival, Presence and Departure of Water-Birds at and near Clark's Island, Plymouth, Mass., from May 1 to December 26, 1852. Forest and Stream, XII, pp. 185, 385, 386.

1881. Browne, F. C. Distribution of Birds as influenced by increase of Water Area. Bull. N.O.C., VI, pp. 126, 127.

Illustrated by notes on 23 Species observed at Framingham, Mass.

1882. Browne, F. C. Remarkable Flight of Warblers. Forest and Stream, XVIII, p. 386.

On twenty odd Species found from May 21 to 26, at Fra-

mingham, Mass.

1882. Cahoon, J. C. (Arrival of Birds at Taunton, Mass.)

Forest and Stream, XVIII, p. 266.

Notes on 22 Species.

1882. Chadbourne, A. P. Rarer birds of Massachusetts. Quarterly Journ. Bost. Zool. Soc., I, pp. 4, 5, 20, 24, 30-35.

List of 80 Species with references.

1883. Cahoon, John C. Massachusetts Winter Notes. Birds Wintering at Taunton, Mass., and Vicinity, during the Winter of 1882-83. Forest and Stream, XX, p. 224.

Notes on 26 Species.

1883. Chadbourne, Arthur P. Birds around Boston during the Winter of 1882-3. Quart. Journ. Bost. Zool. Soc., II, pp. 31, 32.

Notes on 16 Species.

1883. Comstock, S. W. Notes from Greenfield, Mass. Orn. and Oölog., VIII, p. 71.

Notes on some 15 Species.

1883. Job, Herbert K. Notes on Some of the Winter Bird of Massachusetts. Bull. N.O.C., VIII, pp. 147-151.

Notes on 32 Species.

1884. Brewster, William. Notes on the Summer Birds of Berkshire County, Mass. The Auk, I, pp. 5-16.

With especial reference to the faunal position of the region. Contains also notes on certain Species observed at

Pownal, Vermont.

1884. F. H. C(arpenter). Notes from Rehoboth, Mass.

Part I, Raptores. Orn. and O&L., IX, pp. 99, 100.

Part II, Passeres, Ibid, pp. 112, 113.

Part III, Water Birds, Ibid., pp. 125, 126.

April, May and June Notes.

1884. Newcomb, Raymond Lee. Notes on Shore Birds.

Forest and Stream, XXII, pp. 483, 484.

Limicolæ of the Massachusetts Coast.

1884. (Stearns, W. A.) Birds of Amherst. Bull. Mass.

Nat. Hist. I, 3, 4, pp. 6-23. (See also 2, p. 4.)

An annotated list of 164 Species.

1885. Cahoon, J. C. Spring Shore Bird Migration at

Cape Cod, 1885. Orn. and O&L., X, pp. 117, 118.

1885. (Jencks, F. T.) A Collecting Trip to Cape Cod.

Random Notes on Natural History, II, 4, pp. 25, 26, No. 5,
pp. 33, 34.

May notes.

1886. Andres, Charles H. Fall Migration in Bristol

County, Mass. 1885. Orn. and O&L., XI, pp. 1, 2.

Notes on numerous Species from August 14 to December 25.

1886. Allen, J. A. A Revised List of the Birds of Massachusetts. Bull. Am. Mus. Nat. Hist., I, pp. 221-271.

An annotated list of 349 Species.

1886. Cahoon, J. C. Summer and Fall Shore Bird Migration

at Cape Cod--1885. Orn. and O&L., XI, pp. 9, 10.

Notes on numerous Species from July 12 to October 3.

1886. Cahoon, J. C. Winter Notes from Taunton, Mass.
Orn. and Oö1., XI, p. 77.

Brief mention of some 17 Species.

1886. Merck, F. M. A Season's Notes from Bristol County, Mass. Orn. and Oö1., XI, pp. 38, 39, 69, 70.

1887. Andros, Frederic W. A List of the Birds of Bristol County, Mass. Orn. and Oö1., XII, pp. 136, 141, also additions pp. 192, 199.

A briefly annotated list of 207 Species.

1887. Cahoon, John C. The Shore-bird Migration at Monomay Island, Cape Cod, Mass., Spring of 1886. Orn. and Oö1., XII, pp. 57, 58.

Brief notes from May 29 to June 30.

1887. Cahoon, John C. The Shore-bird Migration at Monomay Island, Cape Cod, Mass., Summer and Fall of 1886. Orn. and Oö1., XII, pp. 100, 101.

Notes on numerous Species from July 1 to October 24.

1887. Carpenter, Frederic H. A Record of the Breeding of *Vireo solitarius*, *Spiza americana*, and *Dendroica caerulescens*, in Bristol County, Mass. Pub. Bristol Orn. Club, No. 3.

1887. Clark, Herbert L. The Birds of Amherst and Vicinity, including nearly the whole of Hampshire County, Mass. With an Introduction by Prof. C. H. Fernald, PH.D., Amherst, Mass.: J. E. Williams, Publisher. Svo. pp. 55.

An annotated list of 177 Species. (see also a review in

Auk, V, 1888, pp. 105, 106.)

1887. Dexter, H. F. Order Limicolæ. Its Representation in Bristol County, (Mass). Orn. and Oö1., XII, pp. 147, 148.

Notes on 24 Species.

1887. Read, Hilton B. Our Local Raptors, Bristol County, Mass. Orn. and Oö1., XII, pp. 117-120.

On nineteen Species.

1888. Brewster, William. Notes on the Birds of Winchendon, Worcester County, Massachusetts. Auk, V, pp. 386-393

A nominal list of 82 breeding Species, with notes on 23 of them.

1888. Cahoon, John C. The Shore-bird Migration at Monomay Island, Cape Cod, Mass., Fall of 1887. Orn. and Oö1. XIII, pp. 5-92, also corrections, p. 48.

Notes on numerous Species from August 8 to November 16.

1888. Cahoon, John C. The Shore Birds of Cape Cod. Orn. and Oö1., XIII, pp. 121-124, 153-156, and additions, p. 189; XIV, p. 140.

A list with extended annotations on 38 Species.

1888. Denton, S. W. Winter Notes from Wellesley, Mass. Orn. and Oö1., XIII, p. 104.

Notes on 9 Species.

1889. Bates, Frank A. Wanderings. Orn. and Oö1., XIV, pp. 11, 12.

On a number of Species of birds observed in June in Plymouth County, Mass.

1889. Browne, F. C. Massachusetts Bird Notes. Forest and Stream, XXXII, p. 355.

Nominal list of 50 Species observed May 12, 1889, at Framingham, Mass.

1889. Faxon, Walter. On the Summer Birds of Berkshire County, Massachusetts. Auk, VI, pp. 39-46, 99-107. I. List of Birds observed in Southern Berkshire. Sheffield and Vicinity, June 17-26, 1888, 76 Species. II. List of Birds observed on and near Graylock Mountain, June 28-July 16, 1888, 80 Species.

1889. Ingalls, Charles E. Birds of Templeton and Adjoining Towns. The Gardner, Mass., News, June 1, 1889.

1890. Batchelder, C. F. Recording the number of Birds observed. Auk. VII, pp. 216-218.

A method for recording observations illustrated by notes on 17 Species observed at Cambridge, Mass.

1890. Brewster, William. Summer Robin Roosts. Auk, VII, pp. 360-373.

Based on observations made in the vicinity of Cambridge. Contains also notes on half a dozen other Species.

1890. Cahoon, John C. The Shore Bird Migration at Monomay Island, Cape Cod, Mass. Summer of 1888. Orn. and Oölog., XV, pp. 49-52.

Almost daily notes from June to September.

1890. Cahoon, John C. A Few Spring notes from Monomay Island, Mass., 1890. Orn. and Oölog., XV, pp. 66, 67.

Brief notes on some 14 Species.

1890. ^{Frogar}Frøgar, M. A. From Eastern Massachusetts. Forest and Stream, XXXIV, p. 268.

Notes on Winter birds.

1890. Miller, G. S., Jr. Cape Cod Bird Notes. Auk, VII, pp. 226-229.

Notes on 7 Species.

1891. Bates, Frank A. Wanderings, No. 11. Orn. and Oö1 XVI, pp. 146-148.

Ornithological notes from Sudbury, Mass.

1891. Colburn, Wm. W., and Morris, Robert O. The Birds of the Connecticut Valley in Massachusetts. 16mo. pp. 24. Springfield. Published by the Authors.

A briefly annotated list of 212 Species.

(See review in Auk, VIII, 1891, p. 384.)

1891. Miller, G. S. Jr. Further Cape Cod Notes. Auk, VIII, pp. 117-120.

Notes on 5 Species.

1891. Purdum, C. C. Descriptions of the Nests and Eggs of the Birds of Barnstable County. The Collector's Monthly (Danielsonville, Conn.) II, pp. 23, 24, 29, 30, 39, 65; III, 1892, p. 24.

On 17 Species.

1891. Small, Frederick L. A Few Noted from Cape Cod. Orn. and Oö1., XVI, p. 42.

Brief mention of 23 Species. (See also corrections and

additions, p. 64.)

1891. White, Harry Gordon. Outside in Winter. Orn. and Oö1., XVI, pp. 117-119.

Notes on the Sea-birds of the Massachusetts Coast.

1892. Clark, E. H. Wild-fowl at Cobasset. Forest and Stream, XXXVIII, p. 9.

A nominal list of 24 Species.

1892. Mackay, George H. Habits of the Black-bellied Plover (*Charadrius squatarala*) in Massachusetts. Auk, IX, pp. 143-152.

Mentions also other Shore-birds.

1892. Mackay, G. H. Water Birds at Nantucket, Massachusetts. Auk, IX, pp. 304-306.

Notes on 18 Species.

1892. Small, Frederic L. (Winter Notes from Provincetown, Mass.) Orn. and Oö1., XVII, p. 1,3.

Mentions 10 Species.

1892. White, H. G. Winter Bird Notes from Southeastern Massachusetts. Orn. and Oö1., XVII, pp. 81-86.

Extended notes on 20 Species with in some instances the number of individuals observed.

MAINE.

1861. Holmes, E. Zoology of Maine. Birds. Sixth Ann. Rep. Sec'y Maine Board of Agric., pp. 113-122.

A nominal list of 193 Species. 13 Species added in Re-

port for 1862.

1862. Verrill, A. E. Catalogue of the Birds found at Norway, Oxford Co., Maine. Proc. Essex Inst., III, pp. 136-160.

An annotated list of 159 Species found at Norway and 107 Species observed in the State but not yet found at Norway.

1864. Hitchcock, C. H. A Catalogue of the Birds of Maine. Proc. Portland Soc. Nat. Hist. I, pp. 66-

1872. Maynard, C. J. See New Hampshire.)

1877. Brown, Nathan Clifford. Notes on Birds New to the Fauna of Maine, etc. Bull. N.O.C., II, pp. 27-28.

Notes on 5 Species.

1879. Brown, Nathan Clifford. Notes on a few Birds Occurring in the Vicinity of Portland, Me. Bull. N.O.C., IV, pp. 106-108.

Notes on 9 Species.

1880. Deane, Ruthven. The Marsh and Sooty Terns in Maine and other Birds rare to the State. Bull. N.O.C., V, pp. 63, 64.

Notes on 6 Species.

1880. Merrill, H. Notes on a Few of Our (Maine) Birds. Popular Science Monthly XVII, pp. 386-392.

1881. Comden, M. H. Notes from Maine, Orn. and Oö1., VI, p. 56.

Notes on various Species from "East of the Penobscot".
(See also Counter notes p. 71.)

1881. Sage, John H. Notes from Moosehead Lake, Me.
Orn. and Oö1., VI, pp. 50, 51.

Notes on 11 Species observed in June, 1881.

1882. Batchelder, Charles F. Notes on the Summer Birds
of the Upper St. John. Bull. N.O.C., VII, pp. 106-111, 147-152

Enumerates 105 Species observed at Grand Falls, New
Brunswick, Fort Fairfield, and Houlton, Maine.

1882. Brown, Nathan Clifford. A Catalogue of the Birds
known to occur in Portland, Me. Proc. Portl. Soc. Nat. Hist.
Dec. 4, 1882, pp. 1-37.

An annotated list of 250 Species. (Review in Bull. N.O.C.
VIII, 1883, pp. 112, 113; see also addition of 8 Species and
Notes on 33 of those included in the above list in Proc.
Portl. Soc. Nat. Hist., 1889, pp. 37-40.)

1882. Brown, Nathan Clifford. Remarks on Five Maine
Birds. Bull. N.O.C., VII, pp. 189, 190.

1882. Merrill, Harry. Maine Notes. Bull. N.O.C., VII,
pp. 190, 191.

Notes on 5 Species.

1882-3. Smith, Everett. The Birds of Maine. Forest
and Stream, XIX, pp. 425, 426, 445, 465, 466, 484, 485, 504,
505; XX, pp. 6, 25, 26, 44, 66, 85, 104, 105, 124, 125, 184,
185, 204, 205, 223, 224, 244, 245.

An annotated list of 303 + 4 Species.

(See also a review in Bull. N.O.C., VIII, 1883, pp. 164-166,
and discussion of same by author and reviewed in Forest and

Stream, XXI, 1883, pp. 143, 144, 163, 164, 202.)

1884. Achorn, Chas. A Day Among the Sea Birds of Maine
The Young Oölogist, I, pp. 84, 85.

June Notes from Little Green Island, Seal Harbor.

1884. F. H. C. (=Carpenter, F. H.) Our Northern Rap-
tores. Orn. and Oölogist, IX, pp. 8, 9.

On 6 Species found breeding at the head-waters of the
Magalloway River, Maine.

1886. C(arpenter), F. H. List of Summer Birds of the
Vicinity of Tim Pond, Maine. Orn. and Oölogist, XI, pp. 24, 25.

Notes on 31 Species observed during "the last two weeks
in August and first two in September for ~~two in September for~~
two consecutive years, 1884 and 1885."

1886. Carpenter, F. H. Some Ornithological Explorations
in the Dead River Region of Maine. Orn. and Oölogist, XI, pp. 113-115, 129, 131, 145-147, 161-163, 177-179.

An annotated list of 102 Species based on observations
made from "May 28 to June 14, 1883, Dec. 30, 1883, to Jan. 14,
1884, Aug. 18 to Sept. 13, 1884, and Aug. 19 to Sept. 17, 1885.

1886. Piston, V. E. Collecting among the Sea Birds of
(Rockport), Maine. The Sunny South Oölogist I, pp. 2-3.
(Published by E. C. Davis, Gainesville, Texas.)

1887. Carpenter, F. H. Birds of Northern Maine in Fall,
Orn. and Oölogist, XII, p. 188.

Brief notes on some 20 Species.

1888. Berry, Henry E. From Lincoln County, Maine.

The Oölogist, V, p. 12.

Nesting of some 10 Species.

1889. Brown, John Clifford. Winter Notes from Portland, Maine. Auk, VI, pp. 280, 281.

Notes on 4 Species.

1890. Montgomery, Thos. H., Jr. A List of the Summer Resident Birds of the South-western Coast of Maine. Orn. and Oölog., XV, pp. 161-163.

A briefly annotated list of 65 Species.

1891. Thoreau, H. D. The Maine Woods. Boston and New York, Houghton, Mifflin & Company. 8vo. pp. 1-328. App. IV. List of Birds which I saw in Maine between July 24 and August 3, 1857. pp. 321, 322.

A briefly annotated list of 38 Species observed mostly in the Moosehead region.

1892. Bennett, Elmer, G. Some of the Sea Birds of Maine. The Collectors' Monthly (Danielsonville, Conn.) III, pp. 4, 5.

Oölogical notes on 6 Species.

NEW HAMPSHIRE.

1792. Belknap, J. The History of New Hampshire. (Vol. III,) Containing a geographical description of (the State;) with Sketches of its natural history, productions, improvements, present state of Society and manners, laws and government.----Printed at Boston for the Author, by Belknap and

Young, State Street.--- Sm. 8vo. pp. 1-480, 1-8. Birds. pp. 165-174.

"Annotated list of 123 Spp. of Birds of New Hampshire." (Cones).

1872. Maynard, C. J. A Catalogue of the Birds of Coos Co., N. H., and Oxford Co., Me., with annotations relative to the breeding habits, migrations, etc. With notes by Wm. Brewster, Proc. Bost. Soc. Nat. Hist., XIV, 1871, pp. 356-385.

An annotated list of 164 Species.

1876. Fox, W. H. Three Migrations Compared. Forest and Stream, VI, p. 354.

A table showing arrivals of 56 Species at Hollis, New Hampshire.

1876. Minot, H. D. Summer Birds of the White Mountain Region. Am. Nat. X, pp. 75-80.

Notes from Conway and Bethlehem, N. H.

1877. Goodhue, C. F. The Birds of Webster and adjoining towns. Forest and Stream, VIII, pp. 33, 49, 96, 113, 146.

An annotated list of 151 Species.

1883. Brewster, William. Bicknell's Thrush (*Turdus aliciae bicknelli*) in New England. Bull. N.O.C., VIII, pp. 12-17.

Includes mention of some five Species observed on Mt. Washington, N. H.

1887. Chadbourne, Arthur P. A list of the Summer Birds of the Presidential Range of the White Mountains, N. H. Auk,

IV. pp. 100-108.

An annotated list of 47 Species.

1888. Faxon, Walter, and Allen, J. A. Notes on the Summer Birds of Holderness, Bethlehem and Franconia, N. H. Auk V, pp. 149-155.

Three briefly annotated lists as follows: Holderness, June 4-12, 1885, and June 4-11, 1886, 65 Species; Franconia, June 11-21, 1886, and June 4 to August 1, 1887, 87 Species; and Franconia and Bethlehem, in July and August, 1874, 50 Species.

1889. Allen, Francis H. Summer Birds at Bridgewater and Moultonboro, New Hampshire. Auk, VI, pp. 76-79. I. Birds observed at Bridgewater, 63 Species. II. Birds observed at Moultonboro, 51 Species; briefly annotated.

1889. Sherman, Maurice, S. Birds of Grafton Co., New Hampshire. The Oölogist, VI, p. 74.

Brief notes on a number of Species.

1890-91. Bates, Frank A. Wanderings, No. 9. Orn. and Oölogist, XV, pp. 171-173; XVI, 1891, pp. 33-37, 68, 69.

Contains notes on birds observed in the White Mountains, N. H., in June, 1890.

1891. Nast, J. W. Nesting of Some of the White Mountain Birds. Orn. and Oölogist, XVI, pp. 135, 136.

Notes from Conway, N. H., on 16 Species.

1892. Johnson, J. H. Bird Notes from Central New Hampshire, Winter of 1891-92. Orn. and Oölogist, XVII, p. 72.

Brief notes on 27 Species.

RHODE ISLAND.

1884. Powell, Col. J. H. List of Birds Shot near Newport.

A nominal list of 101 Species.

1884. Rives, W. C. Jr., M. D. The Birds of Newport.
Proc. Newport Nat. Hist. Soc., 1883-84, pp. 28-41.

General remarks on the Commoner Species.

1884. Talbot, H. A. Notes from Warwick Neck, R. I.
Orn. and Oö1., IX, p. 58.

On the nesting of 7 Species.

1888. Southwick, James M. Our Birds of Rhode Island.
Document 6, of the Newport Nat. Hist. Soc., pp. 3-15.

General remarks on several Species.

1888. Lawton, Charles H. The Water Birds of Newport,
R. I. Document 6, of the Newport Nat. Hist. Soc., pp. 16,17.

Brief remarks principally on the Anatidæ.

VERMONT.

1853. Thompson, Zadock. Natural History of Vermont,
with numerous Engravings and an Appendix. Burlington: Pub-
lished by the Author. Stacy & Jameson, Printers 1 Vol. 8vo.
Chapter III. Birds of Vermont, pp. 56-112. Appendix pp. 20-
28.

An annotated list of 161 Species.

1870. Goodhue, D. Catalogue of and Observations on the Observations on the Birds of Vermont. Archives of Sci. and Trans. Orleans County (Vt.) Society Nat. Sci. I, pp. 102-105, 171-174.

Unimportant notes on 18 Species, 14 of which are Raptores.

1876. Briggs, W. A. (Resident and Winter Birds of Montpelier, Vermont.) Forest and Stream, VI, p. 100.

Brief notes on some 20 Species.

1876. Robinson, R. E. Spring Birds of Vermont. Forest and Stream, VI, pp. 318, 319.

Notes on the migration in Addison County from March 14 to June 1.

1882. Knowlton, F. H. Remarks on some Western Vermont Birds. Bull. N.O.C., VII, pp. 63, 64.

Notes on 15 Species.

1882. Knowlton, F. H. A Revised List of the Birds of Brandon, Vt. The Brandon Union, February 10, 1882.

A briefly annotated list of 149 Species.

(See also a review in Bull. N.O.C., VII, 1882, pp. 113, 114.)

1884. Cutting, H. A. Lectures on Milk, Forestry, Our Bird Catalogue, Insects, How to Foretell Storms, Fertilization, etc.... Montpelier, Watchman and Journal Press.

An annotated list of 192 Vermont birds.

1884. Herrick, F. H. Rare Vermont Birds, Science, III.

Notes on 14 Species.

1884. C. O. T(racy). Picidae (of Taftsville, Vt.).

Orn. and Oöl., IX, pp. 132, 133.

Notes on 8 Species.

1885. Johnson, A. J. Winter Birds of Southwestern Vermont for 1885.

Brief notes on some 16 Species.

1885. Tracy, C. O. Notes from Taftsville, Vt. Orn. and Oöl., X, p. 10.

Notes on some 18 Species.

1885. Tracy, C. O. Swallows (at Taftsville, Vt.). Orn. and Oöl., X, p. 71.

Notes on 5 Species and Chaetura pelagica.

1888. Parkhill, C. H. A Day on Dead Creek. Orn. and Oöl., XIII, p. 157.

On several birds observed June 11, 1887, in a marsh half way between "Lake Champlain and Snake Mountain."

1890. Parkhill, C. H. Winter Notes from Cornwall, Vt. Orn. and Oöl., XV, pp. 43, 44.

Notes on 9 Species.

Fibre and Fabric,

185 Summer Street,

Opposite New England R.R. Depot.

Boston, Mass., April 25, 1886.

Mr. Saml Henshaw, Sec'y,

Boston Society of Natural History,

Boston, Mass.

My dear sir:-

I have your esteemed favor of April 24th, referring to the "Brazilian Cardinal." It was a remarkable case, as the bird plainly shows it could hardly have escaped from a cage, as there was not the slightest signs of confinement upon it. Thos. J. Rigney, one of my overseers at the time, at the American Mills at Rockville, was out in the fields. He, like myself, being inclined to Ornithology, saw the bird, saw that it was an entire stranger, and he picked up a stone and threw at it. The stone hit the bird and killed it, and he brought it to me, and I had it carefully mounted, and when I came to Boston, I thought it best to put it in the Natural History Rooms, where it might some time interest some student. There is nothing further that I could say about it. It was, perhaps, a mile from the city of Rockville, which was only a village at that time, and only farm houses scattered about.

I have a copy of the first transactions of the Natural History Society, which would, perhaps, be of value to some one. When I think of it, I will try to mail it to the Society.

Respectfully yours,

J. M. Thayer
FIBRE & FABRIC,
BOSTON, MASS., U. S. A.

Exotic Straggler.

Brazilian Cardinal.

Exotic Straggler.

Brazilian Cardinal.

-:-:-:-:-

THOMAS J. RIGNEY

P. O. BOX 38

Dear Mr. Rigney
this will give all the
is to know about the
Brazilian Cardinal
my tail going
Joan Wade

Joan M. Wade
APR 27 1896

Bound Brook, N. J.,

Apr. 27 1896

Friend Wade,

I have your favor
containing the letter addressed
to you by the Secy. of the
Boston Society of Natural History.
It calls to my mind how
proud was I to rush to your
house and show the rare bird.
I had captured with a stone
thrown by my hand as it
perched near the top of a young
maple or elm.

I have often thought it a
very singular incident as I
so much wanted the bird when
I saw it for you to identify
and it seemed to me a
forlorn hope as I threw at

Exotic Straggler.

Brazilian Cardinal.

-:-:-:-:-

THOMAS J. RIGNEY,

P. O. BOX 387,

Bound Brook, N. J., 189

the bird not thinking I could
hit and yet I wanted to so
very much.

It suggests to my mind as
I write how much can be
done and accomplished when
we put our whole mind soul
and body into our efforts and
endeavors.

I am glad the society has the
specimen and I look forward
with pleasure in anticipation
of seeing it again on some
future trip to Boston.

Am sorry to know you are
suffering with rheumatism from
the effects of Grip and trust
you will soon entirely recover. ^{as ever} ^{think}
Rip over

Exotic Straggler.

Brazilian Cardinal.

-:-:-:-:-

Not return this please

Auk, XIII, April, 1896, p. 182.

Sundry notes.

Mr. Frank Brown, of Chelsea, Mass., who sojourned at Charlotte Harbor, situated on the west coast of Florida, during the winter of 1888, informs me that there is in that neighborhood a small island on which are several dead trees, around the bases of which he noticed large heaps of good sized conch shells. Some of these heaps he should think were ten or twelve feet square. A portion of these shells appeared as if they had been there for years, while others were fresh looking. Inquiring of his boatman who was a resident of the place as to the cause, he was informed that the Eagles brought them there, pulled out the meat which they ate, dropping the shells.

George H. Mackay, Nantucket, Mass.

I am frequently asked if I am ever troubled with insects in my Natural History specimens and I only have one answer—Never—and if my directions are followed no one ever need be. After skinning, immediately cover the moist skin with pure arsenic—be particular to cover every part. I keep my arsenic in a large box and put

my skins right into the arsenic; pull out the leg and wing bones as far as possible so as to introduce the arsenic to the extreme parts; the eye sockets, skull and mouth should be well covered with the preservative. I usually, before mounting, place the specimen in my office cellar, and let it remain twenty-four or more hours, so as to get well impregnated with arsenic. After mounting, brush the bill, legs below the feathers, feet, and ends of the wings that cannot be skinned, with a solution of corrosive sublimate, in alcohol—about a teaspoonful of the former to one-half pint of the latter. I have bird skins that I have designedly left exposed to insects for thirty-five years which to-day are uninjured and will remain so forever—that is a good long time, I know, but they are good for it. I know of several collectors who have laughed at my "useless waste of arsenic," thinking a little just as good, or who prefer arsenical soap, or some other preservatives, whose collections are entirely ruined. I have been in the habit of using from fifteen to thirty-five pounds a year for thirty-seven years in my private collection. It created some merriment in court where I was summoned as a witness in a case of arsenical poisoning, when asked if I was familiar with arsenic, and I replied that I had probably used one-half ton of it. "What!" said the counsel, "given one-half ton to your patients!" When I receive dry skins, I pack them very loosely in a tight large box, leaving space for an iron kettle, in which is placed live coals. On these pour sulphur and close the box tight, leaving it for twenty-four hours or so; and if there are insects in the skins you will find them dead. Then subject the skin to the same arsenical treatment as a fresh skin.—*Wm. Wood, East Windsor Hill, Feb. 12, 1884.*

A strange Rail-like Note.

Cambridge, Mass.

1889. (P. M.). Several years ago a fire, one dry season, June 5. burned over much of the large meadow north of Glacialis and destroyed the grass and bushes as well as eating deep holes in the peaty ground. Over the whole of the burned tract cat-tail flags sprang up the next year and have since flourished to the practical exclusion of all other vegetation. In these cat-tails, near Alewife Brook, I heard a note quite new to me. It was very loud and resembled, somewhat, the outcry of the Clapper Rail but lacked its harsh quality and vibrating undertone. I should render it as kuk-kuk-kuk, kuk, kuk, kuk, given in a descending scale and rather slowly at the end. We waded through the middle of this place although the water was nearly waist deep and the flags so dense that it was impossible to see more than a yard or two ahead. The only birds we could find were a few Red-wings.

June 7. (~~Faxon~~, Torrey and I were on the tracks of the Central R. R. after 7 P.M.). As we were eating our lunch, the big Rail (?) suddenly called in the cat-tail swamp to the south very nearly where I heard him on the 5th. kuk-kuk-kuk-kuk-kuk-kuk-cree-cree-ee the cry prolonged and so loud that it was almost startling though uttered fully 200 yards away. We listened nearly an hour for another repetition but heard nothing unusual. Nearly dark when we left. Stranger not nocturnal.

Destruction of Birds by the Great Cold Wave of February 13 and 14, 1899.—The cold wave which struck the coast of South Carolina was the severest recorded for 200 years. On Monday, February 13, the thermometer registered 14° above zero, with the ground covered with snow from four to five inches deep on a level, while drifts were two feet deep. This is a remarkable occurrence for the coast region and to be seen scarcely in a lifetime. On Tuesday, at 6.55 A. M., the thermometer registered 6° above zero. This excessively cold weather came upon us very suddenly. It was sleeting all day Sunday, February 12, but towards midnight grew suddenly colder, and when morning dawned the whole country was covered with snow. The destruction of bird life caused by this cold wave can scarcely be conceived. To say that Fox Sparrows (*Passerella iliaca*), and Snow birds (*Junco hyemalis*) were frozen to death by the millions is not an exaggerated statement, but a conservative one. There was a tremendous migration of Fox Sparrows on Monday, the 13th, following the coast line of the mainland. They apparently came from the northeast, migrating in a southwesterly direction. Thousands tarried in my yard all day long and swarmed in the piazza, fowl-yard and every place that would afford protection. They would scratch away the snow in order to find a bare place, singing—that is the stronger birds—the whole time, while their companions were freezing by the hundreds. When they were benumbed by the intense cold Boat-tailed Grackles (*Quiscalus major*), and Red-winged Blackbirds (*Agelaius phoeniceus*) would peck them at the base of the skull, killing them and eating them. The stronger Fox Sparrows would also eat their dead companions. It was a most pathetic sight. I caught quantities of Fox Sparrows, Grass Finches, Snowbirds, and Chipping Sparrows and put them into a large cage which I brought into the house and placed before a large fire with the hope of saving them from destruction, but despite this they all died. Very few of these birds were emaciated, and the great majority were fat.

The Woodcock (*Philohela minor*) arrived in countless thousands. Prior to their arrival I had seen but two birds the entire winter. They were everywhere and were completely bewildered. Tens of thousands were killed by would-be sportsmen, and thousands were frozen to death. The great majority were so emaciated that they were practically feathers and of course were unable to withstand the cold. One man killed 200 pairs in a few hours. I shot a dozen birds. Late Tuesday afternoon I easily caught several birds on the snow and put them into a thawed spot on the edge of a swift-running stream in order that they would not perish, but upon going to the place the next morning I found one frozen. These were fearfully emaciated and could scarcely fly. Two birds were killed in Charleston in Broad street. It will be many years before this fine bird can establish itself under the most favorable conditions. The following is a list of birds that I saw which were frozen to death: Fox Sparrow, *Passerella iliaca*; Snowbird, *Junco hyemalis*; Woodcock, *Philohela minor*; Grass Finch, *Poocetes gramineus*; Savanna Sparrow, *Ammadramus sandwicensis savanna*; Chipping Sparrow, *Spizella socialis*; Song Sparrow, *Melospiza fasciata*; Swamp Sparrow, *Melospiza georgiana*; Blue-headed Vireo, *Vireo solitarius*; Hermit Thrush, *Turdus aonalaschkæ pallasi*; Meadowlark, *Sturnella magna*; Mourning Dove, *Zenaidura macroura*; Killdeer, *Agialitis vocifera*; Bluebird, *Sialia sialis*; Catbirds, *Galeoscoptes carolinensis*; Pine Warbler, *Dendroica vigosii*.

Bluebirds and Pine Warblers were decimated. Mockingbirds, Cardinals, Florida Towhees, Carolina Wrens, and all Woodpeckers escaped.—ARTHUR T. WAYNE, Mount Pleasant, S. C.

Auk, XVI, April, 1899, pp. 140-6.

THE NOCTURNAL FLIGHT OF MIGRATING BIRDS..

BY O. G. LIBBY.

IT HAS long been a well-known fact of bird life that, during the migrating season, most, if not all, of the movement north or south takes place in the night. This ensures protection from enemies and opportunity for securing food during periods of rest. Under the cover of darkness, the bird passes safely and secretly through the air. During the day he can search for necessary food and by evening he is again ready to continue his flight.

But the very conditions that shield the migrating birds from danger, also preclude any very satisfactory study of their movements. We know, to be sure, that during the fall migrations, most of the large flocks will be found in the early morning on the north side of groves or belts of timber, and in the spring they are to be found on the south side. We know, too, from observations covering a long period of time that birds are seen in the morning which were not in the neighborhood the day before. And most bird lovers know how distinctly the calls of the migrating birds can be heard during the nights of middle September. Still it must be confessed that in proportion to the magnitude of this movement in the bird world and the importance of the interests at stake, economical as well as biological, our actual knowledge of the migration is exceedingly meager.

The writer has recently made two sets of observations upon the nocturnal flight of birds, an account of which may prove interesting to the general reader. The place of observation first selected was a small elevation west of the city of Madison, Wisconsin, with three lakes in the immediate vicinity. The evening chosen (September 14, 1896) was chilly and a raw southeast wind was blowing, though there were no clouds during most of the time. A total of three thousand eight hundred bird calls were recorded, an average of twelve per minute. This rate, however, varied greatly, sometimes running as high as two or three per second and again falling to about the same number per minute. The largest number of calls counted for any hour was nine.

hundred and thirty-six, between two and three o'clock, though nearly that number were noted for two other hours. Nor were the calls at all confined to the few hours during which they were recorded. They began much earlier in the evening and when the observations ceased, at a little after three, they were heard steadily on long after that hour, with the regularity of the ticking of a clock. Manifestly it is quite impossible to estimate the number of birds represented by these calls. The equation contains so many unknown quantities that no satisfactory mathematical solution is to be expected with our present knowledge of the subject. But it may be very safely assumed that the number of calls must be multiplied many times to express even approximately the size of the flocks that were heard to pass during the course of the observation.

Nothing but an actual experience of a similar kind can at all adequately convey the impression produced by such observations. The air seemed at times fairly alive with invisible birds as the calls rang out, now sharply and near at hand, and now faintly and far away. Repeatedly it seemed as if some of the nearer ones must be visible, so vividly was their presence felt as they passed overhead. All varieties of bird calls came sounding out of the darkness that evening. The harsh squawk of a water bird would be followed by the musical *chink* of the Bobolink. Almost human many of them seemed, too, and it was not difficult to imagine that they expressed a whole range of emotions from anxiety and fear up to good-fellowship and joy. The fine shrill notes of the smaller Sparrows or Warblers were heard only close at hand but the louder ones came from all along the line, east and west. More than once an entire flock, distinct by the unity of their calls, came into range and passed out of hearing, keeping up their regular formation with the precision of a swiftly moving but orderly body of horsemen. The great space of air above swarmed with life. Singly or in groups, large and small, or more seldom in a great throng the hurrying myriads pressed southward. It was a marvel and a mystery enacted under the cover of night, and of which only fugitive tidings reached the listeners below.

The next station chosen was the Washburn Observatory, over-

looking the largest of the lakes in the vicinity of the city. The writer was assisted by Winslow Mallery, to whose patience and accuracy is due not a little of the success attending these initial observations. It was proposed to watch the moon through a small six-inch telescope, and to count the birds as they passed across its surface in the southward flight. For convenience in keeping the record, the whole time of observation was divided into periods of fifteen minutes each and the count for each period kept distinct from the rest. The result exceeded all expectations and well repaid the inconvenience attending such experimental work. During the three nights of observation, Sept. 11, 12 and 13, 1897, a total of five hundred and eighty-three birds were counted, and forty-five during one fifteen-minute period. On the evening of the 12th, three hundred and fifty-eight were counted, the largest number for any one period being thirty-five. The number of birds seen during different hours of the night was very unequal. The maximum number of three per minute was reached at 10.30, and it diminished rapidly to a little more than one third of this number at midnight. From this time the number declined, with three considerable upward variations, to very near the zero point. As to the direction of flight very great diversity was also observed. The predominant direction up to ten o'clock was very nearly south, and but comparatively few birds varied from this. The diversity of direction, however, continued to increase till it reached its maximum between twelve and two o'clock. At this time the eight principal points of the compass were represented by numbers varying from three to twenty-eight; two-thirds of the whole number still maintaining a southerly direction.

The observations as to the number of birds and the direction of their flight tell substantially the same story. The first considerable falling off in the number of birds came at 11.15, and up to 10.45 they were observed to fly largely in one direction, not half that number for any period taking any other direction. Thus the intensity of the migratory movement, measured by the number of birds and the regular direction of their flight, is seen to be at its height early in the evening. The diminishing numbers and increasing variety in direction indicate plainly enough that during the time of observation other things besides migration

were taking place later in the night. This latter conclusion is borne out by the larger number of calls heard toward morning, which may be explained as arising from the effort to reassemble the scattered members of the migrating companies. As a general conclusion to be drawn from the whole observation, it would seem that the great mass of migrants thrusts itself rapidly forward for the first two or three hours in one main direction and that separate flocks maintained this movement many hours later. And that after the first advance was completed, the remainder of the night was spent in more miscellaneous movements, having for their purpose, partly at least, the collecting of the widely separated fragments of the different groups, and the selecting of suitable feeding grounds.

This fugitive glimpse into a new phase of bird life reveals many things besides the two chief points already noted. When one recalls the relatively small size of the moon's surface compared to the length of its path from east to west, within the range of vision, some idea of the whole number of birds passing this line may be obtained. Prof. A. S. Flint of the Washburn Observatory estimated that about nine thousand per hour passed during the entire period of observation, or a total of one hundred and sixty-eight thousand. And when the length of this line is compared to the breadth of the whole country over which birds move, the total number of migrating birds for a given area may be roughly estimated. This states in numerical fashion the meaning of the semi-annual migration of our birds. It falls as far short of expressing what the movement really is as does a census report of revealing the daily life of a city like New York or Chicago.

The movement of the birds across the field of vision irresistibly suggested the rapid, undulatory motion of animalcula under high magnifying power. The time of passage varied from one-tenth to one-half a second. In most cases the movement of the wings was plainly visible, though occasionally a bird passed across like a flash. One bird hung for several seconds on the edge of the field of vision, poising itself by rapid motions of the wings. Several times a bird was seen to change its direction of flight completely, usually going off at right angles. Very rarely

were, the birds numerous enough to be seen two at a time, though this happened once during each evening. Not infrequently currents of air seemed to aid or retard their flight. One bird was seen to move backwards across the field as a slowly flying bird is sometimes seen to do from the window of a swiftly moving train. Many of them sailed instead of flying across, occasionally flapping their wings to steady themselves.

On account of the short time each bird was in sight, and the difficulty of estimating their relative distances, not many of them could be identified. More Swamp Blackbirds were identified than any other, and next to them were the Meadowlarks, of which several flocks were observed. Besides these there were the Crow Blackbird, Sparrow Hawk, Yellow Hammer, and one species of Duck. Many of the birds, from their size and flight, must have been Warblers, but it was impossible to further identify them. A number of birds resembling Gulls were observed in large flocks, but nothing could be determined as to the species. The single Sparrow Hawk seen was moving leisurely along in no particular direction except that he seemed to be following the main stream of birds. His hesitating appearance showed how well concealed were his intended victims, though he had sufficient intimation of their presence to keep him on the track. A more thorough acquaintance with the appearance of the birds in flight would have added greatly to the value of the observations.

How the birds are guided in their nocturnal flight is perhaps the most puzzling question which rises in the mind of the observer. There are two possible solutions of this problem. They may be guided by the stars, or by the contour of the country, the lakes and river valleys. Certain it is that cloudy, and especially foggy nights are not favorable for flight. Birds lose their way and wander from their course as seamen do when there is neither sun nor star to guide them. It may be accepted as settled that birds are not possessed of an infallible instinct that guides them, otherwise they need not be disturbed by a fog. The results of the observations just cited show the same thing. That birds do wander from their course is seen from the great variety of directions taken by them during the night. Certainly not all in a given flock fly in one unvarying direction. Individ-

uals get separated or lost and fly in the widely divergent tracks already referred to. The sudden changes in direction that were observed in certain cases may tell the same story. These birds had perhaps lost their way, and hearing the calls of their comrades, wheeled about to join them. The not uncommon sight of birds of one species in a flock of a wholly different kind also shows how frequently they get lost during their migrations.

The turning of the telescope upon this comparatively unknown field suggests endless possibilities. It affords us a means of surveying a plexus of bird life marvelously intricate and full of discoveries. There is revealed to us a new side of the wonderfully human life of the bird. We can sit quietly by while the march of feathered legions goes on,—unsuspected spectators of one of the great events in the world of flying things. The dangers and difficulties attending such an exodus are very real. Along the flanks of every company or hovering in the rear are the birds of prey watching to pick off every careless straggler. The earliest comers are exposed to all the risks of sudden changes in the weather, and great storms like that of 1895, which destroyed so many Bluebirds. The strain of such a journey is not inconsiderable, and it effectually weeds out all but the most hardy individuals; the young, the sick and the old being the first to fall by the way. Twice each year the migratory birds attempt the marvelous feat and perform it with such silence and celerity that it goes on almost unnoticed. But if each bird in his nocturnal passage were as luminous as a meteor, how the heavens would blaze during the migrating season, and how wonderful would seem their journeyings to and fro. Not the less wonderful do they seem to the true bird-lover, though he can catch only stray glimpses of those numberless hosts that move along their airy highways with each recurring season.

The fewness of such detailed observations as are here briefly sketched leads to the conclusion that their value is not appreciated as it should be. Those who study birds for the pure love of it may find here a delightful glimpse into a fresh field. A telescope is not a necessity, good field glasses will show all but the smallest birds. The larger the number of observers the more accurate will be the general conclusions arrived at in the end.

146 MURDOCH, *A Historical Notice of Ross's Rosy Gull.*

[Auk
April]

Each may do something of value while studying in a new way the familiar problems of bird life. The writer hopes simply to encourage others to work along a line which has been of so much interest to him and which seems so full of new material.

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Birds attracted by hemp and grass seed.

Concord, Mass.

1898. Heavy rain during the night changing to damp snow about March 31. daybreak the snow storm continuing through the forenoon with a strong, chilly north wind. By noon the snow covered the ground to a depth of two or three inches over the fields and in the woods but along the river banks and on the slope in front of the cabin it melted as fast as it fell. The broad space of bare, brown earth in front of our door, covered with hemp and grass seed, attracted an unusual variety of birds which kept increasing in numbers as the day wore on until by noon I had noted the following :-

Robin- two constantly present; a flock of twelve paid a brief visit.

Fox Sparrow- four, one of the males singing freely.

Song " - five or six.

Tree " - six (these are the first that have visited the seed bed).

Swamp " - one.

Junco- three at first others later until fifteen were assembled.

Purple Finch- one in full song.

Phoebe- one flying down to the ground like a Bluebird.

Chickadee- a pair at the meat bone.

Downy Woodpecker- " " " " " "

Sparrows feeding in front of the cabin.

Concord, Mass.

1898. A dismal day with piercing N.E. wind and thickly falling
April 5. snow which loaded down the trees and bushes and covered the
leaf- or grass-strewn surfaces to a depth of several inches
but wherever the unfrozen ground was bare melted as fast as
it struck.

There was a fine flock of Sparrows assembled in front of
the cabin this morning and most of them spent the entire day
there eating, apparently, without cessation. This, I think,
snow-
is their usual habit when, during a ^{snow-}storm, they are lucky e-
nough to find an abundance of food. During the fine weather
of the past week they have visited the seedbed only thrice
daily - at morning, noon, and a little before sunset, there
having been an interval of two or three hours in the forenoon
and one of equal length in the afternoon when the seeds were
wholly neglected.

Remarkable Bird Concert.

Concord, Mass.

1893. I have rarely heard anything to equal the bird singing
Apr. 8. that greeted my ears this morning when, at 8.30 o'clock I
walked down the hill to the boat landing. The air was perfectly still and rather damp thus supplying the most favorable conditions for conveying sound, and literally scores of birds were singing within hearing. Fox Sparrows, Tree Sparrows, Juncos and Song Sparrows were by far the most numerous and persistent singers but there also Bluebirds, Robins, Redwings, Rusty Blackbirds and a Grass Finch or two.

Unusual Assemblage of Swallows on the Meadow.

Concord, Mass.

1893. Swallows were flying over the meadow at evening in unusual numbers. One swarm near Hunt's Pond contained fully sixty birds and they were distributed sparingly over the entire meadows. The bulk seemed to be Bank Swallows but there were very many Barn Swallows, also, feeding broods of young perched on dead branches over the river. White-bellies were present in small numbers and I heard Eave Swallows. There appeared to be no Martins and we saw only four or five Swifts.

Swallow Roost.

Concord, Mass.

1893. Shortly after sunset I saw a large flock of Swallows going to roost in an extensive thicket of button bushes just below Heath's Bridge. There were fully fifty birds, the majority Barn Swallows with perhaps a dozen White-bellies and four or five Bank Swallows. They alighted first on the tops of the bushes and gradually worked their way downward and under the foliage by fluttering from twig to twig a few inches at a time. Sometimes a dozen were beating their wings noisily among the leaves at once and there was much twittering and chattering and petty little bickerings for the best places. All the while a good number of birds were flying about over the river feeding, but one by one they joined the throng among the bushes and when I left all had alighted while all but two or three had worked down out of sight. At first dozens of brick red and snowy white breasts gleamed in the strong light from the west but now there was nothing to be seen but the masses of dark foliage beneath which the host were safely sheltered. During the whole time there were no feints, no sudden inrush, and no panic departures such as I have noted on former occasions.

First heavy nocturnal Migration.

Concord, Mass.

1893. Stepping out of doors at about 9 P.M. I at once heard

Aug.8. Warblers lisping and chirping in various directions overhead.

The sky seemed to be alive with them and the sound of their voices was nearly incessant up to 11 P.M. when I went to bed.

This is the first really heavy nocturnal flight that has passed over Concord this summer. I do not remember to have ever heard more birds within the same length of time.

Aug.9. The mysteries of migration are innumerable and some of them well-nigh inscrutable. To-night, with precisely the same conditions as last night as regards weather and temperature, did not bring one single bird so far as my eyes and ears could detect.

Warbler migrating in "thick" weather.

Concord, Mass.

1893. Soon after dark this evening I started up the Estabrook
Aug. 17. road with the dogs. Just as I reached the open hill top beyond the Burritts' I heard the faint chirp of a Warbler in the distance to the northward. A moment later it was repeated nearer, then directly overhead with great distinctness and finally faintly again to the South. There can be no doubt that the bird was migrating and flying very low down. It could not have been long on its way for night had only just closed in. Hence I am forced to conclude that this bird had started on migration from some point well within the limits of the area covered by the present storm. The weather here this evening was what a sailor would call "thick", the air being filled with fine rain and the clouds hanging low. There was scarcely any wind.

Heavy night flight of Warblers.

Concord, Mass.

1893. As it was getting dark this evening I walked with Mr.
Sept. 9. Hubbard to Dakin's Brook and back. Before the light had faded
in the west Warblers began lisping overhead and for the next
hour it was impossible to listen intently for a full minute
without hearing one or more and often several would call in
quick succession. Evidently the sky thronged with them. No
doubt they were the birds which came last night and spent the
day in the region about and to the northward of Concord.
The flight seemed to slacken at about 8.30 P.M. The night
was clear, still and warm.

Telescope Observations of Migrating Birds.—At Urbana, Illinois, between 9.45 and 10.45 p. m. on the seventh of last October, the writer watched migrating birds through a four-inch telescope directed toward the moon. The diversity in the direction of the flight on this evening seems worthy of record. Out of a total of fifty-four birds, forty-two were flying in a general southerly direction, about one-half of these passing directly southward, while others were headed southwest or southeast. A few passed nearly eastward or westward. The remaining twelve, or nearly one-fourth of the entire number, were flying in a general northerly direction. In determining the direction it was assumed that the flight in all cases was horizontal. Between 9 and 9.20 on the same evening Professor Joel Stebbins, of the department of astronomy, counted thirteen birds flying southward and five flying northward. The wind was from the southeast, and had a velocity of only five miles an hour, as shown by an anemometer record. The temperature at 9 p. m. was 52° F.

Huron, and the cold and snow combined overcame many of them, so that they fell in the lake and were drowned.

Thanksgiving day fell on the 18th, and Mr. Newton Tripp of Forest, spent the day on the lake shore, near Port Franks, and observed hundreds of birds on the shore dead, cast up by the waves. He wrote me about it next day, calculating 5000 dead birds to the mile, and I took the first train to the scene of the tragedy and drove out to the lake shore that night. On the morning of the 21st, I patrolled the beach south from Grand Bend, and after covering several miles and seeing only a few dead birds, I came at last to the region of death. At first the birds were not very close together, but eventually became so plentiful that in one place I put my foot on four, and saw as many as a dozen in four or five feet.

I began a census at once, which I continued until the lengthening shadows warned me to hurry on to the river so as to cross in daylight, but in the two or three hours spent in the count I recorded the following:

1 Black-throated Green Warbler,	4 Robins,
1 Yellow Rail,	5 Fox Sparrows,
1 Blue-headed Vireo,	5 Savanna Sparrows,
1 Red-eyed Vireo,	5 Palm Warblers,
1 Yellow-bellied Sapsucker,	7 Myrtle Warblers,
2 Black-throated Blue Warblers,	12 Lincoln Sparrows,
3 Flickers,	15 Ruby-crowned Kinglets,

An attempt was made to measure the speed of the birds by the method described by Professor Stebbins and Mr. Fath in 'Science' for July 13, 1906. Two telescopes are placed a measured distance apart on a line running north and south. The lines joining the telescopes with the moon are practically parallel, and the time taken for a bird to pass between these lines gives the rate of flight. On this evening only two birds were seen by both observers. The birds were flying southward. Professor Stebbins's calculations indicated that the rate of one was about sixty-eight miles an hour and that of the other about ninety-three miles an hour.

— F. W. CARPENTER, *University of Illinois.*

Auk, XLIV, Jan., 1907, p. 107-108.

A Migration Disaster in Western Ontario.—The early days of October, 1906, were warm and damp, but on the 6th came a north wind which carried the night temperature down to nearly freezing. Near there it stayed with little variation until the 10th, and on the 10th, the north wind brought snow through the western part of Ontario. At London there was only 2 or 3 inches, which vanished early next day; and the thermometer fell to only 32 degrees on the night of the 10th, and to 28 on the 11th, but ten miles west, there was 5 inches of snow at 5 p. m., Oct 10, and towards Lake Huron, at the southeast corner, between Goderich and Sarnia, the snow attained a depth of nearly a foot and a half, and the temperature dropped considerably lower than at London. On that night, apparently, there must have been a heavy migration of birds across Lake Huron, and the cold and snow combined overcame many of them, so that they fell in the lake and were drowned.

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1 Yellow-bellied Sapsucker,	7 Myrtle Warblers,
2 Black-throated Blue Warblers,	12 Lincoln Sparrows,
3 Flickers,	15 Ruby-crowned Kinglets,

18 White-crowned Sparrows,	100 Winter Wrens,
19 Rusty Grackles,	130 Swamp Sparrows,
20 Hermit Thrushes,	131 Golden-crested Kinglets,
22 Brown Creepers,	153 White-throated Sparrows,
24 Saw-whet Owls,	358 Tree Sparrows,
30 Song Sparrows,	417 Juncos.
	Total, 1845.

After consuming all the time I could spare in this work, I walked over two miles or so of beach, where the birds were more common than on the shore where the count was taken; this brought me within half a mile of the mouth of the Sable River, and I then crossed it and turned my steps inland to a railway station.

In Mr. Tripp's letter he spoke of the birds extending for miles along the beach, and I did not even touch the ground he mentioned.

After my return I wrote to various persons near the lake shore and the information received shows up this migration in rather a strange light. It appears that from below Grand Bend, the birds were very numerous until beyond Stoney Point, but towards Kettle Point they diminished and were not plentiful again until Blue Point, beyond which they were "laying six deep in one place." Thus it appears that from the region near Kettle Point to near Blue Point there were very few birds, while northeast of Kettle Point and southwest of Blue Point the destruction was very great.

The northeastern section, of which I covered perhaps two miles, would have approximately 1000 birds to the mile, and the whole section might be perhaps ten miles; the western section probably was thickly covered but the length is unknown, possibly three miles, or perhaps even ten.

The lighthouse keepers to the north report no damage, so it is likely that the migration was limited to the district referred to.

It was a surprise to me to learn that the birds crossed Lake Huron, but Mr. W. W. Cooke tells me that he believes that "the birds fly lengthwise of Lake Huron, *i. e.*, north and south, and also diagonally, northwest and southeast, in either case making the longest possible flight over water. The greatest distance they could find on Lake Huron would be less than 200 miles."

Whether this migration was a southern or southeastern one is hard to say. If southeastern, why were there few from Kettle Point (12 miles) to Blue Point, and if southern, why did not the birds, instead of flying parallel with the east shore, turn east and be saved? I hope some of the migration specialists may be able to throw some light on this matter.

In questioning the few residents I saw, they concurred in saying that this occurrence had no parallel in their experience.

A few notes on the status of the migration of the species in this disaster may be of interest.

The first migration of Juncos in any number was observed at London

at high tide, but are almost dry at low. These flats have been from time immemorial, a great resort for shore birds in their Spring and Fall migrations. Of late years gunning has greatly decreased about here, and where a few years ago many flocks of large birds lunched, not more than one out of a dozen touches to-day. Breech-loading guns, market gunners and city sportsmen are fast exterminating these birds.

I arrived at the island May 7. Found Red and Buff-shouldered Blackbirds abundant. They commenced to lay about the first of June. Song again May 8; became common May 10 and abundant May 27; last seen June 10. Two Semiplumated Plover were seen May 11; became common the 21st and abundant May 21. Did not see any after May 26. Three Semiplumated Sandpipers arrived May 12, and the birds became abundant May 16; last seen June 24. Four Arctic Terns arrived May 13 and were reinforced May 19 by a large number. They remained near the flats until about the 15th of June, when they began to diminish. A few Sanderlings arrived May 13 and were seen in small numbers until June 27. Roseate Terns arrived in small numbers May 19 and remained until about the 15th of June. Common Terns arrived in large numbers May 13, and many remained through May and June. A few breed on the island.

Collected a ♂ Pintail Duck in company with a ♀ May 13. Least Sandpipers arrived in full force May 13 and were abundant on the salt meadows until about June 1. Three Least Terns arrived on the afternoon of May 15; became abundant May 19; first young seen June 13.

May 17, I saw several Bonaparte Gulls on a sand bar. Did not see any after May 29. A

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bunch of about two dozen Red-breasted Snipe arrived May 20. Saw but one afterward, May 22. Saw a bunch of Turnstone May 20; next seen May 25; last seen June 24. Saw an adult ♂ Blackburnian Warbler feeding in the grass on a sand hill near salt meadow. May 20, also shot a ♂ Black-poll Warbler in a low bush the same day. May 23, saw quite a number of Jaegers. One marbled Godwit shot. Found about six Sharp-tailed Finches on salt meadows near a small salt pond. Found them quite abundant May 28. First nest found June 12. About twenty or thirty pair breeding. May 29 collected a Red-backed Sandpiper out of a flock of Sanderlings. Two Hudsonian Curlew arrived June 3 and one stopped until June 25. June 8 saw a Hudsonian Curlew. O. & O. X. Aug. 1885. p. 17-18

Bird Migration.

The Committee of the American Ornithologists' Union who have this work in hand, met in New York on Dec. 17, and agreed upon a plan of operations, the details of which are given by the Chairman of the Committee, Dr. Merriam, in a circular. He says: "The work will not be limited to the accumulation of records of the times of arrival and departure of the different species, but will embrace the collection of all data that may aid in determining the causes which influence the progress of migration from season to season. For the purpose of rendering the result of the season's work as full and valuable as possible, the Committee earnestly solicits the co-operation of every ornithologist, field collector, sportsman and observer of nature in North America."

For convenience in collecting and arranging the material which it is expected will be accumulated by the observers, the

O. & O. IX. Feb. 1884, p.

Spring Shore Bird Migration at Cape Cod, 1885.

BY J. C. CAHOON.

Mononoy island at which the following notes were taken, is a sandy island situated about southwest from the bend or elbow of the southeast part of Cape Cod, at which is located the town of Chatham. The island is eight miles long, and one-half mile wide at its greatest extent. Its greatest altitude from the level of the water is about thirty feet. The island is covered with a coarse grass, moss, ivy, and beach plum bushes. In several low wet places there are small swamps. The island was originally connected with the mainland, but is now separated by a pass. At the north end of the eastern part of the island, is another smaller island, which is separated from the main island at high tide, but is connected by dry flats at low. On the small island are three houses owned by three branting clubs, Boston, Providence and Manchester. To the north and west are flats, which extend for miles and miles. These flats are covered with several feet of water

at high tide, but are almost dry at low. These flats have been from time immemorial, a great resort for shore birds in their Spring and Fall migrations. Of late years gunning has greatly decreased about here, and where a few years ago many flocks of large birds landed, not more than one out of a dozen touches to-day. Breach-loading guns, market gunners and city sportsmen are fast exterminating these birds.

I arrived at the island May 7. Found Red and Buff-shouldered Blackbirds abundant. They commenced to lay about the first of June. Song and Savannah Sparrows abundant. They commenced to lay about the last of May. About a dozen pair of White-bellied Swallows were seen. Commenced to lay about May 30. Build in boxes put up by the fishermen. Spotted Sandpipers common; commenced to lay about the 3d of June. Meadow Larks common; commenced to lay about May 15. Piping Plover common; commenced to lay June 1st. Saw large flocks of American Sheldrake out in the bay. Last one seen June 9. Brant common; last one seen May 17. Loon abundant; last one seen about June 13. Started one Black Duck from a small salt hole on meadow. Saw three Great-Yellows, which became common the next day, May 8th; last one seen June 6. American Herring Gull abundant; last one seen June 24. Four Black-bellied Plover, three ♀ and one ♂, put in an appearance May 8. The same four were seen again May 9; became common May 15 and abundant May 27; last seen June 10. Two Semiplannated Plover were seen May 11; became common the 21st and abundant May 21. Did not see any after May 26. Three Semiplannated Sandpipers arrived May 12, and the birds became abundant May 16; last seen June 24. Four Arctic Terns arrived May 13 and were reinforced May 19 by a large number. They remained near the flats until about the 15th of June, when they began to diminish. A few Sanderlings arrived May 13 and were seen in small numbers until June 27. Roseate Terns arrived in small numbers May 19 and remained until about the 15th of June. Common Terns arrived in large numbers May 13, and many remained through May and June. A few breed on the island.

Collected a ♂ Pintail Duck in company with a ♀ May 13. Least Sandpipers arrived in full force May 13 and were abundant on the salt meadows until about June 1. Three Least Terns arrived on the afternoon of May 15; became abundant May 19; first young seen June 13.

May 17, I saw several Bonaparte Gulls on a sand bar. Did not see any after May 29. A

bunch of about two dozen Red-breasted Snipe arrived May 20. Saw but one afterward, May 22. Saw a bunch of Turnstone May 20; next seen May 25; last seen June 24. Saw an adult ♂ Blackburnian Warbler feeding in the grass on a sand hill near salt meadow. May 20, also shot a ♂ Black-poll Warbler in a low bush the same day. May 23, saw quite a number of Jaegers. One marbled Godwit shot. Found about six Sharp-tailed Finches on salt meadows near a small salt pond. Found them quite abundant May 28. First nest found June 12. About twenty or thirty pair breeding. May 29 collected a Red-backed Sandpiper out of a flock of Sanderlings. Two Hudsonian Curlew arrived June 3 and one stopped until June 25. June 8 saw a Hudsonian Curlew. O. & O. X. Aug. 1885, p. 117-118

Bird Migration.

The Committee of the American Ornithologists' Union who have this work in hand, met in New York on Dec. 17, and agreed upon a plan of operations, the details of which are given by the Chairman of the Committee, Dr. Merriam, in a circular. He says: "The work will not be limited to the accumulation of records of the times of arrival and departure of the different species, but will embrace the collection of all data that may aid in determining the causes which influence the progress of migration from season to season. For the purpose of rendering the result of the season's work as full and valuable as possible, the Committee earnestly solicits the co-operation of every ornithologist, field collector, sportsman and observer of nature in North America."

For convenience in collecting and arranging the material which it is expected will be accumulated by the observers, the

O. & O. IX, Feb. 1885, p.

several Greater Yellow-legs seen; no Arctic Terns seen for several days. Aug. 17, saw several flocks of Black-bellied Plover. Aug. 18, wind S. W.; a flock of Golden Plover arrived to-day, but did not make any stop. Aug. 27, wind N. W., and blew very fresh; found a small bunch of seven Pectoral Sandpipers in a meadow; no Least Tern seen; saw one bunch of young Robin Snipe and Turnstone together; Sanderlings more abundant; two Marsh Hawks, one Nighthawk and several Summer Yellowbirds seen. Aug. 28, fair; collected a male Solitary Sandpiper, one Baltimore Oriole, one Summer Yellowbird and a female Redstart. These I secured among some old drift-wood on the beach. Saw one Kingbird and quite a number of Warblers, Sparrows and Swallows; Barn Swallows abundant; saw a flock of ten young Black Tern. Aug. 29, wind N. W.; Summer Yellowbirds quite common. Aug. 31, wind S. E., rain fell in the morning; Black Tern very abundant; saw as many as several hundred during the day; saw one flock of twenty-three sitting on the flats, but did not observe an adult among them; one Golden Plover seen.

September 1, wind S. E., and foggy; saw a large flock of about one hundred Black-bellied Plover. Sept. 2, wind N. W.; saw a young Robin Snipe; several Great Northern Divers seen off in the bay. Sept. 3, wind S.; Black Tern very abundant. Sept. 4, wind S. W.; saw a small flock of Black Ducks; Semipalmated Plover and Sandpiper's growing less abundant. Two adult Roseate Tern shot to-day; they had red bills same as the Common Tern; one Tern secured had no tarsus, it being gone from the first joint above the foot. The stump had healed and left a little hard bunch on the end. Sept. 6, wind S.; new arrival seen was one Eskimo Curlew, which I flushed out of some moss on the sand hill. Sept. 7, wind S., cloudy; Roseate and Common Tern very abundant on the sand bars; one Jaeger seen. Sept. 8, wind N. E., cloudy; Sanderlings less abundant, and nearly all remaining are young. Young Black-bellied Plover seen to-day for the first time; Richardson's Jaegers common; large numbers of White-bellied and Barn Swallows flying about; Sharp-tailed Finches abundant. Sept. 9, wind S. W., rained all day; saw large numbers of Black Tern feeding on the meadows that were overflowed; Sanderlings diminishing every day. Sept. 22, wind S. E., rained part of the day; several large flocks of Black-bellied Plover arrived. Sept. 23, wind blowing fresh from the N. W.; the storm of last night caused a "flight" of Shorebirds. I found on the flats, at low tides, Sanderlings, Red-backed Sandpipers (young) and Black-bellied Plover abundant. On the meadows, which the rain had

overflowed, I found Semipalmated, Least, Red-backed and Pectoral Sandpipers abundant. Greater Yellow-legs and Willets also seen on the meadows. Collected two Hudsonian Curlew and one Bonaparte's Sandpiper out of a flock of Semipalmated Sandpipers. After flushing the Pectoral Sandpipers, noticed some would only fly a short distance and drop down in the grass, while others would jump up like the Wilson's Snipe and fly in an irregular course until at quite an altitude, when they would circle for a short time overhead, then suddenly pitch down and alight in the same place they started from. When they fly a short distance their cry is a single low "tweet," but when they spring up quickly and fly a long distance their cry is louder and often repeated. Sept. 24, while in the meadows collecting Pectoral Sandpipers, I had the good fortune to secure an adult male Buff-breasted Sandpiper that was leaving the meadows high up in the air. Sept. 25, wind N., blew very fresh in the afternoon; shore birds not as abundant as the day previous; no arrival was a Hudsonian Godwit, which I shot on the flats. One small flock of Golden Plover seen. Richardson's Jaegers more abundant; saw six at one time chasing Tern. Sept. 26, wind S.; only a few Sanderlings seen; Pectoral Sandpipers are diminishing in numbers. Found a Sora Rail dead on the beach, probably killed by flying against a stake. Sept. 28, wind N., cloudy with light rains all day; found Hudsonian Curlew, Greater Yellow-legs and young Red-breasted Sandpipers common; several small flocks of Black-bellied Plover seen. Loons and Sea Coot flying about. Sept. 29, wind N.; Richardson's Jaegers common; also saw two Long-tailed Jaegers; collected six Jaegers in different plumage. When one is shot the others hang over it, so that many can be killed at one time. Saw as many as twenty-five sitting on the flats. Several that I shot had sand eels in their bills. Sept. 30, wind N.; only a few Pectoral Sandpipers seen on the meadows; a large flock of Black Ducks noticed. Shot an American Bittern near a small pond hole.

October 1, wind N.; Jaegers abundant; several flocks of Sanderling seen, also a few Black-bellied Plover. Oct. 2, wind N. E., foggy; found one Bonaparte's Sandpiper on the flats in company with Red-backed, do. Sanderlings scarce; Terns leaving. A small flight of Greater Yellow-legs arrived last night. Oct. 3, wind W.; a few Sanderlings and Red-backed Sandpipers remain. Greater Yellow-legs quite abundant; a small flock of the Black-bellied Plover seen. Saw several Green-winged Teal and Shovelers in a small pond on the meadows. Saw a Turnstone on the beach. Large Gulls abundant.

Summer and Fall Shore Bird Migration at Cape Cod—1885.

BY J. C. CAHOON.

In the August number of the O. and O. I gave a list of the shore bird migration at Monomoy Island. Below is a list of the summer and fall migrants. No notes were taken between June 26 and July 12, as I was away from the island during that interval.

July 12, weather fair; found four Semipalmated Sandpipers on the flats and several Least, do, on the meadows; Roseate and Least Tern abundant; Arctic Tern common; young Spotted Sandpipers full grown. July 13, fair; no new arrivals noted. Found four Semipalmated Sandpipers feeding along the surf the same as Sanderlings. July 14, cloudy with wind S. E.; heavy rain in the morning. This storm brought along a large number of Least and Semipalmated Sandpipers; several Least Tern collected were moulting. July 15, fair and cooler; collected young Piping Plover which were full grown; found a nest of the Least Tern containing two eggs, incubation fresh. July 16, fair; Semipalmated Sandpipers abundant. July 17, foggy; collected a Velvet Scoter. July 18, clear; new arrivals seen were five Willets and several Petrel. July 21, wind S. W. and blew very fresh, rain fell in the afternoon; found four Red-breasted Snipe and several Semipalmated Sandpipers on the flats; two of the Snipe secured were adults; saw two Greater Yellow-legs. July 23, wind E.; saw a large flock of Coot out in the bay. July 27, wind S. E.; among new arrivals were several bunches of Sanderling and three adult Robin Snipe. July 31, wind E.; saw two Richardson's Jaegers; Least Tern diminishing in number.

August 1, wind E.; new arrivals were a small number of Black-bellied Plover; Semipalmated Plover abundant. August 4, wind blowing fresh from S. E.; rained a part of the day. Aug. 6, wind N. E.; found Red-breasted Snipe and Turnstone common; one large flock of about fifty Black-bellied Plover seen; a Willet and a Hudsonian Curlew noticed. Aug. 7, a bunch of five Robin Snipe seen. Aug. 8, found a young Least Tern that could hardly fly. Aug. 13, wind S. W., foggy all day; six young Bonaparte's Gulls, fifteen Greater Yellow-legs, and four Black Ducks noted as new arrivals. Aug. 15, wind S. W., light rain in the morning; a large flock of Yellow-legs seen; new arrival, a Black Tern; Piping Plover are leaving the island. Aug. 15, wind N., blew fresh; number of Black Tern, increased to seven, only one of which was an adult; one Jaeger and

several Greater Yellow-legs seen; no Arctic Terns seen for several days. Aug. 17, saw several flocks of Black-bellied Plover. Aug. 18, wind S. W.; a flock of Golden Plover arrived to-day, but did not make any stop. Aug. 27, wind N. W., and blew very fresh; found a small bunch of seven Pectoral Sandpipers in a meadow; no Least Tern seen; saw one bunch of young Robin Snipe and Turnstone together; Sanderlings more abundant; two Marsh Hawks, one Nighthawk and several Summer Yellowbirds seen. Aug. 28, fair; collected a male Solitary Sandpiper, one Baltimore Oriole, one Summer Yellowbird and a female Redstart. These I secured among some old driftwood on the beach. Saw one Kingbird and quite a number of Warblers, Sparrows and Swallows; Barn Swallows abundant; saw a flock of ten young Black Tern. Aug. 29, wind N. W.; Summer Yellowbirds quite common. Aug. 31, wind S. E., rain fell in the morning; Black Tern very abundant; saw as many as several hundred during the day; saw one flock of twenty-three sitting on the flats, but did not observe an adult among them; one Golden Plover seen.

September 1, wind S. E., and foggy; saw a large flock of about one hundred Black-bellied Plover. Sept. 2, wind N. W.; saw a young Robin Snipe; several Great Northern Divers seen off in the bay. Sept. 3, wind S.; Black Tern very abundant. Sept. 4, wind S. W.; saw a small flock of Black Ducks; Semipalmated Plover and Sandpiper's growing less abundant. Two adult Roseate Tern shot to-day; they had red bills same as the Common Tern; one Tern secured had no tarsus, it being gone from the first joint above the foot. The stump had healed and left a little hard bunch on the end. Sept. 6, wind S.; new arrival seen was one Eskimo Curlew, which I flushed out of some moss on the sand hill. Sept. 7, wind S., cloudy; Roseate and Common Tern very abundant on the sand bars; one Jaeger seen. Sept. 8, wind N. E., cloudy; Sanderlings less abundant, and nearly all remaining are young. Young Black-bellied Plover seen to-day for the first time; Richardson's Jaegers common; large numbers of White-bellied and Barn Swallows flying about; Sharp-tailed Finches abundant. Sept. 9, wind S. W., rained all day; saw large numbers of Black Tern feeding on the meadows that were overflowed; Sanderlings diminishing every day. Sept. 23, wind S. E., rained part of the day; several large flocks of Black-bellied Plover arrived. Sept. 23, wind blowing fresh from the N. W.; the storm of last night caused a "flight" of Shorebirds. I found on the flats, at low tides, Sanderlings, Red-backed Sandpipers (young) and Black-bellied Plover abundant. On the meadows, which the rain had

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October 1, wind N.; Jaegers abundant; several flocks of Sanderling seen, also a few Black-bellied Plover. Oct. 2, wind N. E., foggy; found one Bonaparte's Sandpiper on the flats in company with Red-backed, do. Sanderlings scarce; Terns leaving. A small flight of Greater Yellow-legs arrived last night. Oct. 3, wind W.; a few Sanderlings and Red-backed Sandpipers remain. Greater Yellow-legs quite abundant; a small flock of the Black-bellied Plover seen. Saw several Green-winged Teal and Shovelers in a small pond on the meadows. Saw a Turnstone on the beach. Large Gulls abundant.

The "Shore-bird Migration at Monomoy Island, Cape Cod, Mass., Spring of 1886.

BY JOHN C. CAHOON.

By permission of the Bristol County Ornithological Club.

I arrived on the island May 29th, and found Piping Plover, Arctic, Roseate, Wilson's and Least Tern very common. Among the other birds noted were Spotted Sandpiper, Semi-palmated Plover, Semi-palmated Sandpipers, Savannah Sparrows and Sanderlings. Several large flocks of "Coot" were seen flying over the island; Red-wing Blackbirds and Meadow Larks were common.

May 31, wind north-east; rain fell in the afternoon. One Red-breasted Snipe and twenty Black-bellied Plovers seen; Richardson's Jaegers quite common. June 1st, wind north-east, clear; Sanderlings common. On going down to the sand bars, I noticed several Bonaparte Gulls, while the Herring Gulls were abundant. June 2nd, wind south, cloudy; Black-bellied Plover common. A Brant was shot by a gunner to-day. The bird was not a cripple, and was a late occurrence for this species. Six Laughing Gulls were seen flying very high. June 3rd, rainy; wind south, blowing very

fresh, followed on the 4th by clear weather and north-east wind. A single Robin Snipe seen to-day; a few Sanderlings and Black-bellied Plover still remain. June 8th, wind south-west. The weather the day previous was very stormy and brought along to-day several Greater Yellow-legs and Turnstones. Large numbers of Night Herons begin to come on the island at high tide. June 9th, cloudy, wind south-west and blew fresh. Three Robin Snipe and several Bonaparte Gulls observed; Herring Gulls remain in large numbers. June 10th, wind north-east and south. First Least Tern in young plumage seen to-day. June 14th, wind east. First set of Least Tern's eggs found to-day. June 15th, cloudy; a bunch of eleven Black-bellied Plover seen; Herring Gull slightly diminishing in numbers. June 16th, wind east and south-east; thick fog all day. A number of Least Tern found building on the high beach. June 17th, wind south-east and south, rain and fog all day. Thick fog brought in over the meadows quite a number of Wilson's Petrel. Sheldrakes and Jaegers noted. June 18th, wind north-west and weather clear; only two Petrel seen. June 25th, wind south-east, accompanied by light rains. A small flock of Plover still remain on the flats. Arctic Terns, which have not been seen for some time have now become more common. June 26th, wind south-west, clear. Saw a very large Tern, evidently a Caspian or Royal, fly over, but owing to distance could not identify for certainty. June 28th, wind north-east. A Robin Snipe, adult female, was shot out of a bunch of three; a very late occurrence. June 30th, wind north-east and south-east, clear. Not any of the *Lincole* noticed to-day; Herring Gulls still remain in numbers.

The preceding notes only comprise the latter part of the migration as the height of the movement transpires between the first and middle of May. The birds were late this spring and only a few stopped on the island and those for only a brief time. There was a large flight of Phalarope about the 15th of May, and I was informed by a gunner that they flew back and forth over the island and were so tame that they could be caught alive from a boat. These pretty little swimmers are reported in large numbers by the fishermen who go out many miles from land, who call them "Whale birds." They are seen in large flocks sitting on the water and will allow a boat to approach within a few yards and when they fly it is for a short distance away.

It was decidedly buff in color with only a few small brownish spots on its surface.

On Thursday, May 26th, we had a pretty long drive before us and we started off before four o'clock a. m. We took Abney's road back in the hills to Cheyenne. The country was quite hilly, and in fact we were riding along on top of an immense table land some 2000 feet above the level of the plains. A species of wild sweet pea grew very abundantly; they were very fragrant. We came in sight of Cheyenne, "the Windy City," and then we turned south.

We had some trouble in getting out of the hills, tipped over once, and when we were out steered direct for a large knoll some thirty miles to the south. It was three o'clock p. m. before we got there at the sluggish pool near the base, and a dusty or more tired outfit could not be imagined. We rested till six o'clock p. m., and then struck out again for Packard's sheep rancho or Cone Tree, only twenty miles from Greeley. I worked the creek next day and secured three more sets of Western Red-tail, and three hours driving put us back into Greeley.

The Shore-bird Migration at Monomoy Island, Cape Cod, Mass., Summer and Fall of 1886.

BY JOHN C. CAHOON.

July 1st; the birds about the island at this date were Herring Gulls, Roseate, Common and Least Tern, Red-wing Blackbirds, Song and Savannah Sparrows, Sharp-tail Finches, Meadow Larks and Piping Plover. On July 15th, the Least Sandpipers and Sanderling became common. The day following was cloudy with light rains. Semipalmated Sandpipers were common together with the Red-breasted Snipe. The first Black-bellied Plover was seen to-day. The 17th was very foggy all day with south and south-west wind. Saw about twenty-five Sanderlings, all adult, and four that were moulting about the neck. First young of the year, Piping Plover and Spotted Sandpiper seen to-day, full grown. Richardson's Jaegers became common. One Wilson's Petrel was seen on the 18th, and several Semipalmated Plover and two Yellow-legs on the 19th. July 20th, wind south-west, weather fair. New arrivals to-day were one Hudsonian Curlew and two Greater Yellow-legs. Sanderlings were abundant and Semipalmated Plover common.

No new arrivals were noted between July

20th and 23rd. On the 27th a Turnstone was seen and an increase of Sanderlings noted. July 29th, first arrival of young Sanderlings to-day and a small bunch of Greater Yellow-legs seen on the flats. A heavy tempest on the morning of the 20th brought along a small flight of shore birds; three flocks of Robin Snipe seen, Turnstone common. Saw a Stilt Sandpiper in company with some Semipalmated Sandpipers on the flats. Two adult Black Tern noticed; the first this season. A large bunch of Black-bellied Plover and a few Yellow-legs arrived Aug. 4th. Saw two Laughing Gulls, both adults. The Sanderlings seem to be diminishing in numbers. An increase of the Black-bellied Plover was noticed on the 5th, several large flocks being seen. No adult Sanderling are now seen, all being immature birds. The first Pectorals were seen on the 9th, and several Stilt Sandpipers were shot by sportsmen on that date. Four Willet arrived on the 11th. Two Arctic Tern were seen on the 13th, being the first noticed for some time. Four Sheldrake were seen on the 19th.

Aug. 20th and 21st, wind north-east; shore birds scarce, only a few Semipalmated Sandpipers seen. 22nd, Wilson's Petrel were common out in the bay. Aug. 25th, wind south-east and north-east, blew very fresh. A flock of about thirty Golden Plover arrived to-day, but only one was secured. Aug. 26th, four flocks of Golden Plover observed to-day. Sanderlings increasing in numbers. Jaegers abundant. The wind and rain on the 30th brought along a flight of birds on the following day. A large flock of Golden Plover, several flocks of Yellow-legs and a few Greater Yellow-legs were found on the meadows. Pectorals abundant. One Bonaparte and one Buff-breasted Sandpiper collected. Sanderlings were abundant on the flats at low tide, Young Turnstone common. Several large flocks of Black-bellied Plover seen. Shot a Carolina Rail on the meadows.

Sep. 9th, wind south-west; foggy. A flock of twenty Golden Plover came to-day. Young Black Tern seen. Sep. 21st, wind west; clear and cool. Two Hudsonian Curlew collected on the meadows; a few Golden Plover seen; Sanderlings scarce. Sep. 22nd, wind north-east. New arrivals to-day were young Red-backed Sandpipers. Young Black-bellied Plover abundant on the high beach at high tide. Mr. F. H. Carpenter, who spent a short time with us, shot a large number to-day. A small flock of Surf Ducks seen. Sep. 23rd, wind south-east; blew very fresh with heavy rain-fall, which brought

along a number of birds. Young Black-bellied Plover abundant; young Robin Snipe and Sanderlings very common. A few Greater Yellow-legs seen. Sep. 24th, wind north-east to south-east. A Bonaparte Sandpiper shot. A flock of Golden Plover seen leaving the meadows and several Hudsonian Curlew noted. Richardson's Jaegers abundant.

Sep. 30th, wind north-east with light rain. Increase in number of shore-birds. Red-backed Sandpipers, Black-bellied Plover and Robin Snipe abundant. Greater Yellow-legs common. Several Bonaparte Sandpipers seen. Two Great Blue Herons seen on the meadows. Oct. 1st, wind north-west. Greater Yellow-legs increasing in numbers. Several Black-backed Gulls arrived to-day. The first comers of the Tit Larks appeared. Oct. 2nd, wind north-west. New arrivals this date are Bonaparte and Kittewake Gulls. The shore-birds seem to be decreasing. Mr. Carpenter shot an adult female Duck Hawk in the act of eating a Black-bellied Plover that it had caught. Two Hudsonian Godwit seen on the meadows. Oct. 3rd, wind south-east. Several Night Herons seen. Oct. 4th. Black-bellied Plover decreasing. Sanderling common. Several Semipalmated Sandpipers seen. Pectoral Sandpipers common. Two Hudsonian Godwit seen on the meadow and one shot by Mr. Carpenter. Several Bonaparte Sandpipers seen on the meadows. A few Roseate Tern heard. Oct. 6th. All species of shore-birds except Sanderlings are decreasing. On the 8th Bonaparte Gulls became common and Richardson's Jaegers very abundant. A great decrease in Terns was noticed on the 9th. Tit Larks became abundant on the 10th.

Oct. 11th, wind south-east. Only a few Tern seen to-day. Red-backed Sandpipers, Semipalmated Plover, and Sanderlings are still abundant on the high beach at full tide. A number of Black-bellied Plover yet remain. Oct. 22nd, wind north-east; blew fresh and cool. Black-bellied Plover, Sanderling, Red-backed Sandpiper and Greater Yellow-legs are common. Found only four Pectoral Sandpipers on the meadows. A few common Tern yet remain. Kittewake Gulls noted. Oct. 23rd, wind north-east; blew fresh, cloudy and cold. Several small bunches of Black-bellied Plover seen. A few Sanderlings and Red-backed Sandpipers remain on the flats. Old Squaw Ducks are common. Oct. 24th, wind south to south-west. I left the island to-day, leaving behind me Herring, Kittewake and Bonaparte Gulls; Common Tern; Red-breasted Sheldrake, Long-tail,

Surf, and Black Duck; Black-bellied Plover, Sanderlings and Red-backed Sandpipers, Greater Yellow-legs, Tit Larks, Meadow Larks and Black Snow birds.

O. & O. XII, Jul. 1887 p. 100-101

a large flock of Barn and White-bellied Swallows flew past towards the north, and in a few moments returned, flying south. There were several hundred in the flock and it was composed of young and adults.

Shortly after Mr. Whiting started four Golden-winged Woodpeckers out of the beach grass and secured two specimens. A Winter Wren dwarfed shrubs while others would be thickly dotted with the growth. The low shrubs seem adapted to the liking of some, though the majority prefer the height of from two and one-half to six feet, from our observations coupled with those of Mr. Cheney. Ross Island made a good showing after a morning's search, but the other islets which fringe the coast do not seem favorable to its nidification; the main seems to be the proper place and here we met with best success. From a series of eight sets, taken on the island, before me, there is considerable variation as to markings, the ground being invariably white.

No. 1. Contains four eggs, which are spotted chiefly about the crown with vandyke brown. A wreath of brown blotches encircles the base of each specimen.

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two following is a list of the birds we saw:

Golden-winged Woodpeckers, six seen. Cedar Waxwings, saw a flock of five and two shot; one male adult and one young. Hermit Thrush (*tol. com.*), keeping close in the thick bushes, Yellow Warbler (*tol. com.*), all seen and one shot, adult male. Saw and shot one female Redstart. Several (*gg.*) Maryland Yellowthroats seen. We also saw several other small birds that we could not identify.

The next morning, the 18th, we went over to the swamp to see if there was any increase in birds, but didn't notice any. Saw a Pigeon Hawk make a dive down into the swamp after a small bird, which it missed. While returning, started a Short-eared Owl out of the beach grass, and he alighted some distance ahead, down near a sand hole, as I thought. I tramped about the place, but could not flush him, and was just giving up the search when I saw a Sparrow Hawk dart down at something on the sand a short distance ahead of me. At each dart I heard a note that I knew came from the owl, and looking closely saw it directly below

the hawk. As the owl flew up I gave him the first barrel and turned to give the hawk the second, but he improved the few moments and was out of gun shot.

The same day Mr. Whiting took a Brown Creeper that was on the roof of the house.

O. & O. XII. Nov. 1887 p. 184-185.

Brief Shore Bird Notes.

BY JOHN C. CAHOON.

Our early flight of adult Sanderlings, Red-breasted Snipe, Red-breasted Sandpipers and Black-bellied Plovers occurred at about the same time as the last season's one, but was very light; in fact the absence of all kinds of shore birds has been very noticeable. The south-east storms of the last two weeks have increased the few scattering Black-bellied Plovers into several good-sized flocks, mostly young, also several small bunches of Great Yellow-legs and Golden Plovers.

Pectoral and Bonaparte's Sandpiper have not put in an appearance as yet. A few young Sanderling just arriving, also young Red-backed Sandpipers. I have never seen an adult Red-backed Sandpiper in the fall.

Yesterday I saw several large flocks of Black-bellied Plover on the beach at high tide.

At present writing to-day, it has been stormy with thick fog and the number of shore birds is greatly increased. I saw first Black Tern (young) of the season to-night, some dozen in number.

Monomoy Island, Cape Cod, Aug. 25, 1887.

O & O. XII. Oct. 1887 p. 170

O. & O. Nov. 1887

Flight of Land Birds on Monomoy Island, Cape Cod, Mass.

BY JOHN C. CAHOON.

A flight of land birds took place on this island on or about September 17th.

The wind blew fresh from the north for several days preceded with cool weather, and this had no doubt started the birds on their southward journey.

The first notice that I had of the presence of these birds was on the morning of the 17th, when Mr. J. Whiting, a gentleman that was with me at the time, and myself were over on the high beach after Plover. While in my blind

a large flock of Barn and White-bellied Swallows flew past towards the north, and in a few moments returned, flying south. There were several hundred in the flock and it was composed of young and adults.

Shortly after Mr. Whiting started four Golden-winged Woodpeckers out of the beach grass and secured two specimens. A Winter Wren visited him in his blind and hopped along over his gun, and for this apparent unconcern for man he escaped with his life. Mr. Whiting also saw a Fox-colored Sparrow near a marsh while on his way to the boat.

In the afternoon we made a visit to a small swamp on the middle part of the island. This swamp is composed of a thick growth of beech, plumb, bayberry and other bushes, with wild briars in abundance. It is small, not containing over one-fourth of an acre.

On our way over the swamp we found Savannah and Song Sparrows abundant.

Our first capture was an adult male Blue Yellow-backed Warbler, which I shot from a small bunch of bushes. On arriving at the swamp we saw some six or more Golden-winged Woodpeckers make off, and although I shot several I could not find them, as the bushes were so thick where they fell. After spending several hours in hard, tiresome work tramping through and around the swamp, as the rents in Mr. W.'s trousers could testify, we started back for the house, deciding that the swamp was "bad medicine."

The following is a list of the birds we saw: Golden-winged Woodpeckers, six seen. Cedar Waxwings, saw a flock of five and two shot; one male adult and one young. Hermit Thrush (*tol. com.*), keeping close in the thick bushes, Yellow Warbler (*tol. com.*), all seen and one shot, adult male. Saw and shot one female Redstart. Several (*yg.*) Maryland Yellowthroats seen. We also saw several other small birds that we could not identify.

The next morning, the 18th, we went over to the swamp to see if there was any increase in birds, but didn't notice any. Saw a Pigeon Hawk make a dive down into the swamp after a small bird, which it missed. While returning, started a Short-eared Owl out of the beach grass, and he alighted some distance ahead, down near a sand hole, as I thought. I tramped about the place, but could not flush him, and was just giving up the search when I saw a Sparrow Hawk dart down at something on the sand a short distance ahead of me. At each dart I heard a note that I knew came from the owl, and looking closely saw it directly below

the hawk. As the owl flew up I gave him the first barrel and turned to give the hawk the second, but he improved the few moments and was out of gun shot.

The same day Mr. Whiting took a Brown Creeper that was on the roof of the house.

O. & C. X. H. Nov. 1887 p. 184-185.

Brief Shore Bird Notes.

BY JOHN C. CAHOON.

Our early flight of adult Sanderlings, Red-breasted Snipe, Red-breasted Sandpipers and Black-bellied Plovers occurred at about the same time as the last season's one, but was very light; in fact the absence of all kinds of shore birds has been very noticeable. The south-east storms of the last two weeks have increased the few scattering Black-bellied Plovers into several good-sized flocks, mostly young, also several small bunches of Great Yellow-legs and Golden Plovers.

Pectoral and Bonaparte's Sandpiper have not put in an appearance as yet. A few young Sanderling just arriving, also young Red-backed Sandpipers. I have never seen an adult Red-backed Sandpiper in the fall.

Yesterday I saw several large flocks of Black-bellied Plover on the beach at high tide.

At present writing to-day, it has been stormy with thick fog and the number of shore birds is greatly increased. I saw first Black Tern (young) of the season to-night, some dozen in number.

Monomoy Island, Cape Cod, Aug. 25, 1887.

O & O. XII. Oct. 1887 p. 170

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The Spring and Fall Plumage of Our Shore Birds.

BY JOHN C. CAHOON, TAUNTON, MASS.

Under the above heading in the August number of the O. AND O., Mr. F. H. Carpenter speaks of the error into which many ornithologists have fallen in dividing the conditions of plumage of birds, especially those of order *Limicolæ*, and says: "That such a distinction of plumage should receive due attention and classification is without dispute, but when the division is based upon the change in seasons rather than age of the birds, some exceptions should be cited."

I am glad that Mr. Carpenter has opened this subject, as for some time I have been trying to find an opportunity to express my ideas concerning the plumage of our shore or beach birds, but should have neglected to do so but for Mr. Carpenter's remarks, which have drawn my attention to it. I have given the matter a careful consideration, and from my own experience have been unable so far to make any exceptions why the division of plumage should not be based entirely upon the age of birds rather than the change in seasons. In my following remarks, taken from notes of some seven seasons spent among our New England shore birds, I shall endeavor to throw as much light on the subject as possible.

That our shore birds receive less attention than any of our North American birds can be easily seen by looking through the columns of magazines and papers devoted to Ornithology. The inaccessibility of their haunts, their erratic flights and wariness, renders it no easy task for the study of our *Limicolæ*. Their range of migrations is wide, extending from their northern breeding homes in the Arctic regions to the tropical countries below the equator, where most of them resort to in the winter. To observe their date of arrival and departure during

their migration seasons, their plumage and habits, one must necessarily be out on their feeding grounds behind his blind and decoys in all kinds of weather, from early in the morning until late at night, for a variety that was rare to-day may become abundant to-morrow.

The plumage of all birds is a subject that I think requires more careful study than any other relating to ornithology. In most of our land birds the male has a brighter dress than the female, while in our shore birds there is no sexual difference in the brightness of plumage.

All birds are said to be in their brightest plumage in the breeding season, but that there are exceptions, and that some birds are brighter in the fall and winter, all ornithologists and collectors know. One that has especially come under my observation, both in the breeding and fall plumage, in which the fall is much brighter, is the Purple Grackle (*Quiscalus purpureus*).

I think all ornithologists will agree with me that it takes a certain number of years for a bird to attain the adult or full plumage, and the brighter and more conspicuous the adult plumage, the more seasons it requires to complete it. It may be that birds with plain dress require as many seasons to it, but there is so little difference in the young and adult plumage that we do not notice the length of time that it requires to complete it. Any one may see the different seasonal stages of plumage by looking over a number of skins collected in the spring, taking male orioles, tanagers, or any bright-colored species for examples. You will see quite a number of distinct stages from the dull plumage of the second season to the bright one of the adult.

In our New England shore birds, I think the Black-bellied Plover is the most noticeable in its different seasonal stages of plumage. In examining many specimens of this bird, I am cer-

tain that it requires as many as four seasons at least for it to get its adult plumage. Taking spring specimens for instance, as at this period we do not find any in the young of the year plumage. We see specimens in the first changes of the young of the year into adult, being speckled with black on the belly and slight changes not seen in the young of the year. By examining closely, we can pick out specimens with the belly much speckled with black, about half changed into the adult plumage, and then the third stage, which will be very near the adult, having its belly mostly black, and its forehead and sides of neck showing ashy white, and then the last or adult with the under parts pure black and forehead and sides of neck pure white. We now see one of the handsomest of our shore birds with plumage so different from the young of the year that we can scarcely believe it to be the same bird. This adult or full plumage, which has taken four seasons to perfect, is retained I am sure on the New England coast in the fall. The above changes I have noticed will apply to the Golden Plover (*Charadrius dominicus*), Red-breasted Snipe (*Macrorhamphus griseus*), Robin Snipe (*Tringa canutus*), Sanderling (*Calidris arenaria*), and several others.

The adult bird arrives in the fall migration first, and is followed in a month or six weeks by the young of the year, and I have noticed that the birds in adult plumage are closely followed by those in the mixed dress and then the young of the year. I think the reason why the young of the year do not arrive with the adults or older birds, is that that they are not matured enough to make the long flight the older birds do when they leave their northern homes. That where we see one bird in the adult plumage in the fall, we see many in the immature, is due partly from the fact there would be more young after the breeding season than old, and partly that the old birds migrate further South, and being more wary fly far out to sea, only a few touching on our New England coast. I have noticed that most of the shore birds seen on the Florida coast in the winter are young birds. I collected and observed Sanderlings at all times during the winter and into spring, and did not take one in adult plumage, or see any changing into that until all at once they began to put in an appearance in adult plumage. The New England shore birds that I have had an opportunity to study at the spring and fall migrations, and which I found to retain their adult plumage in the fall, are as follows:

Turnstone (*Streptilas interpres*).
Black-bellied Plover (*Squatarola helvetica*).
Golden Plover (*Charadrius dominicus*).
Semiplumated Plover (*Egialites semiplumatus*).
Piping Plover (*Egialites melodus*).
Wilson's Snipe (*Gallinago media wilsoni*).
Red-breasted Snipe (*Macrorhamphus griseus*).
Robin Snipe, or Red-breasted Sandpiper (*Tringa canutus*).
Pectoral Sandpiper (*Actodromas maculata*).
Bonaparte's Sandpiper (*Actodromas fuscicollis*).
Least Sandpiper (*Actodromas minutilla*).
Semiplumated Sandpiper (*Ereunetes pusillus*).
Sanderling (*Calidris arenaria*).
Greater Yellow-legs (*Totanus melanoleucus*).
Yellow-legs (*Totanus flavipes*).
Buff-breasted Sandpiper (*Tryngites rufescens*).
Spotted Sandpiper (*Tryngoides macularius*).
Hudsonian Curlew (*Numenius hudsonicus*).
Eskimo Curlew (*Numenius borealis*).
Silt Sandpiper (*Microphalama himantopus*), taken in the fall in the changing plumage of young into adult. There are several other shore birds that I have taken specimens of in the fall, but as they have passed out of my hands, I am not certain what plumage they were collected in.

I have not seen any specimens of Red-backed Sandpipers (*Pelidna alpina americana*), in full adult plumage in the fall, the first arrivals wearing mostly adult plumage, but as I have been informed by gunners that they have shot specimens in full adult plumage in the fall, I cannot make a single exception as yet of our New England shore birds not retaining their adult plumage in the fall.

We should be pleased to hear from our correspondents on this subject, the plumage of our Limicola. O. & O. XII, Dec. 1887 p. 193-194.

Up a Stump.

BY WALTER HOXIE.

My woodpeckers have gone; I don't know when they went, but I missed them to-day. I ting around that way to see how they were getting along but the old stump was silent and deserted. They have been great company for me ever since I found them carpentering away so busily one breezy day last spring. (What I really wanted was to get their eggs, for naturalists are all thieves by instinct, although on

brown and lilac. The remainder of the surface is almost wholly without markings. Very small: .60 x .47; .61 x .46; .62 x .47; .63 x .47.

Set XXVI. June 8, 1886. Hell Gate, East Side, New London County, Conn. Four eggs, fresh. Nest in green savin. *usnea* covered, low down. Other nests in near neighborhood. Many birds in colony. Eggs white and quite glossy. Heavily marked near the larger ends with large spots of bright reddish brown and a few lilac spots. The markings form wreaths, and the remainder of the eggs are immaculate: .65 x .47; .66 x .50; .67 x .47; .68 x .49.

Set XXVII. June 11, 1886. Groton, Long Point, Conn. Four eggs, fresh. Nest in swamp maple, eleven feet from the ground. Female covering eggs. Eggs light creamy white, spotted over most of their surface, but especially near the larger ends, with light reddish brown and lilac: .65 x .47; .67 x .47; .66 x .47; .66 x .47.

Set XXVIII. June 4, 1881. Groton Long Point, Conn. Four eggs. Nest in stunted maple on edge of wooded swamp. Birds near. Eggs glossy, creamy white, unmarked except at the larger ends, where they are beautifully wreathed with light reddish brown and lilac spots: .66 x .48; .64 x .47; .65 x .48; .65 x .47.

Set XXIX. May 25, 1881. Hell Gate, Preston, Conn. Three eggs, incubation begun. Nest in small dead savin, six feet from the ground. Eggs creamy white, heavily marked near the larger ends with very bright reddish brown and lilac spots: .68 x .49; .69 x .48; .68 x .46.

Set XXX. June 7, 1883. Long Point, Groton, on Fisher's Island Sound (Long Island Sound) Conn. Four eggs, fresh. Nest in large hornbeam tree, outside of swamp. Made of hanging lichen, on lowest limb. Female covering clutch until touched. Eggs glossy, creamy white, heavily marked over most of their surface with light reddish brown and lilac. The markings principally take the form of large spots, closer together near the larger ends in three of them, but in the fourth they are grouped around the smaller end. The markings are unusually heavy for this species: .63 x .48; .62 x .46; .61 x .47; .56 x .48.

Set XXXI. June 1, 1886. Long Society, Preston, Conn. Three eggs. Nest in green birch sprout, about three feet from ground. Female on. Eggs glossy, creamy white. Very heavily blotched with very bright reddish brown and lilac. The blotches are unusually large and confluent for this species, and are nearly all grouped around the larger end. Re-

markably showy eggs: .65 x .47; .67 x .48; .66 x .50.

Set XXXII. June 4, 1886. Rehoboth, Bristol County, Mass. Collected by Frederic H. Carpenter. Five eggs, incubation advanced. Nest the usual pendant structure of *usnea*; nearly globular, and placed on an old moss-covered apple tree, fifteen feet from the ground. Words fail to describe this exceedingly brilliantly colored set, which were generously presented to the writer by Mr. Carpenter. The ground color is pure white, unsullied by the slightest stain. The markings are chiefly confined to the larger ends, and consist of large spots of the most brilliant vermilion red. No coloration on any other eggs of this species ever seen by the writer approaches it in brightness, and the contrast of the very bright red with the pure white makes a very beautiful appearance: .65 x .46; .63 x .44; .66 x .47; .65 x .45; .67 x .46.

Set XXXIII. May 31, 1887. Hell Gate, Preston, Conn. Five eggs, fresh. Nest in only bunch of *usnea* on dead juniper, five feet from ground. Conspicuous from its position midway on long, clean horizontal branch. Female seen many times; both parents observed when set was taken. Eggs pure white, and very glossy for this species. Speckled and spotted with dark reddish brown and lilac. The markings form wreaths near the larger ends, and are not perceptible on any other parts of the eggs. One of them has the markings entirely of a light lavender wreath, composed of specks of that color: .61 x .49; .59 x .46; .59 x .48; .63 x .48.

Set XXXIV. June 1, 1884. Standish, Maine. Collected by L. C. Holmes. Five eggs, fresh. In low evergreen, nine feet from the ground. Eggs creamy white, quite glossy; speckled and spotted with dark reddish brown and lilac. The markings form indistinct wreaths near the larger ends; very long and pointed: .72 x .49; .71 x .48; .71 x .48; .71 x .48; .69 x .47.—J. P. N.]

The Shore-bird Migration at Monomoy Island, Cape Cod, Mass., Fall of 1887.

BY JOHN C. CAHOON, TAUNTON, MASS.

(Report of the Cape Cod Migration Station of the Bristol Ornithological Club.)

Arrived on the Island Aug. 8th, but was so busy until Sept. 10th that my observations were not as full as I should desire at that period.

Aug. 8th, wind north-east, weather fair. Semipalmated Plover and Sandpipers (ad.) abundant. Terns of two species, Common and Roseate, abundant. Large Gulls, presumably the Herring, common. A few Black-bellied Plover and Robin Snipe seen in adult plumage. Heard several Greater Yellow-legs and saw three Piping Plover in young of year plumage.

Aug. 9th, wind south-west, weather fair. Birds same as previous day.

Aug. 10th, wind south-west, weather fair. New arrivals noted; two Hudsonian Curlew and several small flocks of adult Sanderlings.

Aug. 12th, wind south-west, weather fair. Birds same as two previous days. Saw gunners that had in their possession several Red-breasted Snipe, young plumage, one Greater Yellow-legs and several Piping Plover, young plumage. They informed me that they had shot a large Sandpiper with long legs, and from the description I decided it to be a Stilt Sandpiper.

Aug. 23rd, wind south-west to south-east, moderate with light fog. Several large flocks of Plover seen flying over the island, one of Golden and the others Black-bellied. Saw quite a number of Red-breasted Snipe and Sanderlings, a small number of Greater Yellow-legs seen.

Aug. 24th, wind south-west and north-east to south-east, weather stormy. Large flocks of Plover, mostly Black-bellied, seen flying about the island and a large number seen on the beach at high tide, one Carolina Rail seen on the meadow, two flocks, one of six Black Ducks and the other a small one of Scoters, flew over the house.

Aug. 25th, wind north-east to north-west, weather stormy. The stormy, foggy weather of yesterday and to-day increased the numbers of birds. Black-bellied Plover seen in large flocks passing over but only a few stopping. Semipalmated Sandpipers abundant, some dozen or more Black Tern (young) seen for the first time to-day.

Sept. 4th, wind north-east, fresh, weather fair. Increase noticed in Greater Yellow-legs, several Sheldrakes seen in the bay.

Sept. 5th, wind north-east to south, weather fair. No increase in shore birds. Sheldrakes and Scoters on the increase.

Sept. 6th, wind south-west, very fresh, weather fair. An adult Red-breasted Sandpiper or Robin Snipe seen; water fowl increasing.

Sept. 7th, wind west, very fresh, weather fair. A bunch of ten Yellow-legs seen on the mead-

ows and four shot by Mr. W. Several Hudsonian Curlew and Greater Yellow-legs came to-day.

Sept. 8th, wind north-west to north-east, moderate, weather fair. Mr. Whiting took several Hudsonian Curlews and Turnstones (adult) several of Greater Yellow-legs, Yellow-legs and Golden Plover noticed.

Sept. 9th, wind north-east to east, moderate, weather fair. Several large flocks of Black-bellied Plover arrived. Collected some fine specimens of Hudsonian Curlew and adult Turnstones.

Sept. 10th, wind south to south-west, stormy. Nine Hudsonian Curlews seen to-day. Mr. Whiting took a fine adult Eskimo Curlew. These birds are now scarce, where five years ago they were abundant. First Pectoral Sandpiper of the season taken to-day. I collected young Turnstone, Piping Plover, Sanderling and Semipalmated Plover. Sanderlings on the increase; Richardson's Jaeger common and on the increase.

Sept. 11th, wind north-east to east, moderate, weather fair. Several Red-breasted Snipe, (young) seen. Among birds shot to-day was a Black-bellied Plover in nearly adult plumage.

Sept. 12th, wind south-east, fresh, weather stormy. Two bunches of Eskimo Curlew, one of twenty and the other of fifteen seen. Sanderlings increasing; first Red-breasted Sandpipers seen and shot to-day.

Sept. 13th, wind east, weather fair. The heavy wind and storm of yesterday brought along a small flight of birds. Sanderlings (young) much increased; Black-bellied Plover increased, a large number seen on the flats. Several small bunches of Red-breasted Sandpipers (young) seen; four Golden Plover seen on the meadow by myself and afterwards seen by Mr. W., who shot one in young plumage. Greater Yellow-legs increased.

Sept. 14th, wind east to south-west, moderate, weather foggy. Pectoral Sandpipers increased and ten shot on salt meadows; no other increase noted.

Sept. 15th, wind north, very light, weather fair, birds about the same as previous day; slight increase in Red-breasted Sandpipers and Black-bellied Plover in plumage; Scoters abundant out in bay.

Sept. 16th, wind north, very fresh, weather fair; several large flocks of Black-breasts seen.

Sept. 17th, wind north, fresh, weather fair, Sanderlings increased. Out of thirty-five shot, all were in young plumage. A bunch of six Golden Plover still remain on the meadow. A

flight of land birds occurred. (O. & O., Nov. 1887, page 184.)

Sept. 18, wind north to south-west, moderate, fresh, weather fair; greater Yellow-legs on the increase; other birds remain the same.

Sept. 19th, wind south-west, very fresh, weather fair; birds about the same; one Black Tern shot; very late migrant.

Sept. 20th, wind north to north-east, weather fair; noticeable decrease in birds; one decrease particularly noticed was Sanderlings; a flock of twenty (young males). Red-breasts seen. Semipalmated Plover and Sandpipers. One Pectoral shot on meadow; only one seen. Richardson's Jaegers. Common Terns on the decrease. Saw several large flocks of Night Herons flying South just at dark.

Sept. 21st, wind south-west, very fresh, weather a little foggy; birds remain the same. On high beach at high tide saw very few birds. On the flats just at dark, I saw several small flocks of Black-bellied Plover and Sanderlings.

Sept. 22nd, wind south-west, very fresh, weather light rains; birds remain the same.

Sept. 23rd, wind north-east, moderate, fresh; slight increase in Black-bellied Plover and Sanderlings.

Sept. 24th, wind north-east, very fresh, weather light rains; birds much decreased. One small bunch of Black-bellied Plover, one Sanderling, and one Red-breasted Sandpiper, are the birds that were seen on the flats to-day. Increase in large gulls. Several large flocks of Sheldrakes and three Black Ducks seen.

Sept. 26th, wind west to south-west, fresh, weather foggy; Red-backed Sandpipers arrived in small flocks. Two small flocks of Red-breasted Sandpipers were found on the flats.

Sept. 27th, wind north, moderate, weather fair; increase in Black-bellied Plover and Sanderlings. Bonaparte's Sandpipers noticed for the first time to-day, and some dozen or more seen in company with Sanderlings. Saw a flock of six Golden Plover flying about, and I think they were the same that were seen a few days ago.

Sept. 28, wind southwest, moderate, weather fair; birds remain the same. Found a Duck Hawk on the high beach near the surf engaged in eating a Sanderling. Shot at it twice, and although badly wounded, it retained life enough to get out beyond the surf before falling.

Sept. 29th, wind south-west to south-east, moderate, weather foggy; Shore birds remain about the same. Large flock of Scoters seen out in the bay.

Sept. 30th, wind north-east to east, moderate, weather foggy; decrease in birds. Several Red-breasted Sandpipers taken on the high beach.

Oct. 1st, wind east, north-east and south-east, weather heavy rains. The number of Sanderlings and Red-backed Sandpipers much increased. All of Sanderlings and nearly all of Red-backed Sandpiper being in young plumage. A (young male) Duck Hawk shot while in the act of catching a Red-backed Sandpiper out of a large flock on the beach. Several others seen. Saw a Belted Kingfisher and Fish Hawk near the house.

Oct. 3rd, wind southwest to south, moderate, weather rainy; great increase in Sanderlings and Red-backed Sandpipers. Saw large flocks of both. No Roseate Terns seen for about a week, they having departed for the South. Other terns much decreased, and the remaining ones being young. Three Golden Plover found on the meadow and one (in yg. of year plumage) shot. Noticeable increase in large gulls. Several large flocks of Great Blue Herring seen. Red-headed Woodpecker (young male), shot flying over the island.

Oct. 4th, wind north-west in morning, light, changing with fog, to south-west, moderately fresh. Increase in Sanderlings and Red-backed Sandpipers. Decrease in terns. A Roseate Tern shot with a number of common Terns. A flock of twenty Great Blue Herons seen on the high beach at high tide. No Jaegers seen. Saw two Duck Hawks on the high beach at a cut through where the water on the east or ocean side of the island makes a break through the beach into the bay on the west side of the island. The hawk was after some sanderlings that congregated near the cut through at high tide, and although it made several dives into a flock that was following, I did not see it catch one, as I was on the opposite side of the cut through, and the tide ran so swiftly that I could not cross in my boat. I was obliged to let the hawk continue his raid. The second one I saw was trying to catch a sanderling that was running along on the beach, but the sanderling was quick enough to elude the swoops of the hawk, who at my approach flew away a short distance and alighted on the beach. Soon after I shot into a flock of sanderlings, and several fell out in the water about twenty-five yards from the shore. The hawk, which had started up at the report of my gun, saw the sanderlings drop and came flying over me and swooped down close to one of the sanderlings in the water. It seemed afraid to take the sanderling from the water, but would rise

up a short distance above the sanderling and make a dive down to within a few feet of it, and hang there for a minute or two. My shells were all loaded with fine shot, and I shot several times at the hawk before he would leave his prey. He flew quite a distance up the beach and alighted on the sand near the surf, but before I had got out of sight I saw him back where I had left the sanderling.

Oct. 6th, wind north-west to south-west, weather fair; small increase in Black-bellied Plover. Only a few terns seen. Small increase in Greater Yellow-legs. Shot Red-breasted Sandpiper in adult plumage out of a flock of Black-bellied Plover. Saw several large flocks of Night Herons just at dark. Bonaparte's Sandpipers seen in small numbers.

Oct. 7th, wind south-west, very fresh; small decrease in birds. Two small flocks of Black-bellied Plover seen. Collected one out of four Golden Plover found on the meadow; also a Semipalmated Sandpiper, which is very late for this last bird to be found about here. Titlarks come about the edges of the meadows. Belted Kingfisher seen on sand bluff.

Oct. 10th, wind south-east, light, weather fair; small decrease in birds. All of sanderlings collected in changing plumage. Saw several flocks of Black-bellied Plover.

Oct. 11th, wind north to north-east, very fresh, weather rainy. Increase of Greater Yellow-legs. Several flocks of Black Ducks flying about.

Oct. 12th, wind north-west, fresh, weather fair. Increase in Greater Yellow-legs. Two Carolina Rails shot on the meadows. A bunch of six tern seen out in the bay.

Oct. 13th, wind north-west, very fresh, weather fair. Increase in Black Ducks. One Golden Plover taken on the meadow. Several small bunches of Black-bellied Plover and Greater Yellow-legs seen.

From Oct. 13th to Oct. 25th, I was away from the Island, and no notes were taken during that time.

Oct. 25th, wind north-west to south-west, light. Water fowl much increased, and saw large flocks of scoters, sheldrakes and ducks. Several small flocks of sanderlings and Black-bellied Plover remain. Greater Yellow-legs and Red-backed Sandpipers.

Oct. 25th, wind north-east to east, fresh, weather cloudy. Shore birds the same as previous day. Yellow-rumped Warblers and Black Snowbirds come. Saw a flock of seven Horned Grebe and two Long-tailed Ducks out in the bay.

Oct. 27th, wind north-east, fresh, weather cloudy. Small increase in Greater Yellow-legs. Saw several hundred of Bonaparte's Gulls on the bars. Three taken were in young plumage.

Oct. 28th, wind east, moderate, weather fair. Saw large numbers of Bonaparte's Gulls. Out of twenty taken, three were in adult plumage. Twelve or more Great Black-backed Gulls seen. Long-tailed Ducks, one Red-breasted Sandpiper and one Tern noticed.

Oct. 29th, wind south-east, light, weather fair. Shore Birds greatly decreased. Two Horned Grebe seen out in the bay.

Oct. 30th, wind north-east to north, weather fair and cold. Large numbers of Titlarks flying about. Five Pectoral Sandpipers and four Snow Buntings found on the meadows. One Ipswich Sparrow taken at the edge of the meadows.

Oct. 31st, wind north-east, moderate. Three flocks of Sanderlings and Red-backed Sandpipers seen, also several small bunches of Black-bellied Plover. A large flock of Bonaparte's Gulls on the bars. Out of twenty-two taken, six were in adult plumage. Three Pectoral Sandpipers still remain on the meadows.

Nov. 1st, wind north-east, blowing a gale, with rain, hail and snow. Large number of Black Duck seen. Found one Golden Plover and several Pectoral Sandpipers on the meadows, and shot the former. Other Shore Birds seen were six young Black-bellied Plover, two Greater Yellow-legs, several Sanderlings, and a small bunch of Red-backed Sandpipers. Several Shore Larks noticed.

On Nov. 2nd, wind north-east to north-west, fresh, weather fair. A few scattering Sanderlings seen on the beach at high tide. Bonaparte's Gull remains the same. Out of nineteen taken, about half were in adult plumage.

Nov. 3rd, wind north-east, light, weather fair. A bunch of twelve Black-bellied Plover and a few Sanderlings on the beach at high tide. Saw one Kittiwake Gull flying over.

Nov. 4th, wind south, very fresh, weather fair. Sanderlings seen on the flats at low tide. Two Black-bellied Plover seen on the meadow and one on the flats. One Greater Yellow-legs on meadow. Large flocks of Long-tailed Ducks flying about. Two flocks of Brant, one of twenty and the other of six, seen near the cut through in the shoal water on the flats. Shore larks common. Several Snow Buntings and a Robin seen near the house. Large flocks of scoters, large gulls, sheldrakes, and Eider duck seen on the water outside of the

surf. Saw a large seal swimming outside of the breakers.

Nov. 5th, wind north-west, very fresh, weather fair and cold. A walk out on the sand hills and meadows was taken in the forenoon. Found a large number of Shore Larks but no Titlarks. Meadow Larks abundant. Went over on to the beach at high tide in the afternoon. Shore Birds seen were four Black-bellied Plover, three Sanderlings, and fifteen Red-backed Sandpipers. One Red-poll Warbler taken in the bushes near this house.

Nov. 6th, wind west to southwest, very fresh, weather fair. Snow Buntings very common. Saw flocks of ten to forty flying about and several pairs feeding on the beach, on seeds washed ashore from the sage grass. Several Ipswich Sparrows and one Field Sparrow seen on the sand bluffs.

Nov. 7th, wind south-west, very fresh, weather fair. Shore birds remain the same. Large number of shore larks distributed over the island.

Nov. 8th, wind south-west, fresh, weather fair. A flock of sixty Brant seen on the flats, and a bunch of eight geese out in the bay. Several Horned Grebe seen near the Island.

Nov. 10th, wind south to south-east, moderate, fresh, weather fair. Three Black-bellied Plover the only shore birds seen to-day.

Nov. 11th, wind west, very fresh. Only birds noticed on the island were Shore Larks, Snow Buntings, and Meadow Larks. A flock of twenty geese flew over the house.

Nov. 12th, wind north-west, very fresh, weather fair. Saw one Greater Yellow-legs. A flock of Buffle-headed Ducks seen and a few shot.

Nov. 13th, wind north, moderate, weather fair. No shore birds seen. Shore larks and water fowl flying about in large numbers.

Nov. 14th, wind south-west, moderate, weather fair. The wind being light and the weather pleasant, I improved the opportunity by cruising about in my boat nearly all day. Found a large flock of Bonaparte's Gulls in the bars. One Kittiwake Gull and a young of Wilson's Tern taken, and were the only ones seen. A flock of twenty Brant, and a bunch of four and six Elder Ducks, observed in the channels between the flats. On the beach at high tide found a flock of fifteen, and four Black-bellied Plover, and several small bunches of Red-backed Sandpipers and Sanderlings. Over one-half of Bonaparte's Gulls now seen in adult plumage.

Nov. 15th, wind south-east, very fresh,

weather rainy. Black Ducks seen in small numbers on the meadows which were overflowed, also started three geese off of the meadows. No shore birds seen.

Nov. 16th, wind north-west, weather fair. Large flocks of water fowl flying about. No shore birds seen.

In the Fall migration, shore birds have not been as plentiful as usual this season, and, in fact, several have been scarce. There were no flights of Pectoral Sandpipers that we have in September, and only a few Yellow-legs were seen. It may be that these birds did not stop with us on account of the meadows not being mowed, so that they could not feed in those places. The Greater Yellow-legs were far short of their usual number. Terns did not stop as late as last season.

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The Shore Bird Migration at Monomoy Island, Cape Cod, Mass., Summer of 1888.

No notes were taken between May 27th and June 8th, as I was away from the Island during that period. June 8, 1888, wind northeast to north, fresh. Saw one small flock of Black-bellied Plover on the flats, and one Greater Yellow-legs on the meadow. Large Gulls, (mostly Herring) much decreased. Water fowl seen were three Sheldrakes. Night Herons increasing on the meadows.

June 9th, wind northeast to southwest, fresh in the afternoon. No shore birds seen.

June 12th, wind northwest to north, fresh; weather, fair. A bunch of six Great Northern Divers seen out in the bay, and six Richardson's Jaegers passed over the island. Red-winged Blackbirds, Sharp-tailed Finches, and Savannah Sparrows breeding at this date.

June 13th, wind southwest, moderately fresh; weather fair. One flock of about twenty Black-bellied Plover passed over the island high up in the air.

June 14th, wind south, moderately fresh, with rain in the afternoon. Found Least Terns common on their breeding ground on the high beach, but found none nesting. Found two nests of Piping Plover, one with four eggs, and the other with one. Saw several Scoters flying down the beach outside of the breakers.

June 15th, wind south to southwest, moderate, with light rain and fog. Took a long tramp out over the flats but saw no shore birds. Saw one flock of seven Sheldrakes flying about out in the bay.

June 16th, wind all ways, moderate; weather fair. One Greater Yellow-legs the only shore bird seen. Saw six Great Northern Divers out in the bay.

June 18th, wind southwest, fresh; weather

fair. Large Gulls tolerably common. A few Sheldrakes remain.

June 19th, wind northeast, fresh; weather fair. One flock of Sheldrakes noticed. Night Herons abundant on the salt meadows.

June 20th, wind southwest in forenoon, fresh, northeast in afternoon, becoming calm. No water birds seen excepting Night Herons.

June 21st, wind southeast, fresh with thick fog. Only shore birds seen were several Spotted Sandpipers.

June 22d, wind southwest, fresh, with fog most of the day. Went up on to the high beach. Found Least Tern nesting. A nest with one egg found, and saw several fishermen that had collected several sets. Not a day passes in the summer that the fishermen about this island do not patrol the beach in search of the Tern's and Piping Plover's eggs. The birds have no chance to breed. When I first visited the island about six years ago there were several hundred pairs of Least Tern breeding, but they have now become reduced to less than twenty-five pair. Several Scoters seen flying about on the outside. Found Piping Plover and Spotted Sandpipers common at the Point.

June 27th, wind northwest, fresh; weather fair. A few Great Northern Divers still remain out in the bay. Some fifty or more large Gulls are seen about the bars. Terns on the increase.

June 28th, wind northeast, fresh; weather cloudy with rain after 4 P.M. Saw four Great Northern Divers near the beach. Saw two "cripples," a Semipalmated Plover and Sandpiper in down, running about in the beach grass.

June 29th, wind northeast, fresh with light rains. Visited the high beach and found several sets of two eggs each of the Least Tern. Large numbers of Roseate and Common Terns seen flying along over the beach or fishing outside of the surf. Large Gulls decreasing.

June 30th, wind southwest, fresh; weather fair. Large numbers of Tern seen about the island to-day.

July 1st, wind northeast and blew a gale all day, with rain in the evening. Terns very abundant on bars near the "out-through." Young Spotted Sandpipers tolerably common.

July 2d, wind northeast, fresh. Very few large Gulls seen at this date. Terns on the increase. One Great Northern Diver remains about the island.

July 3d, wind southwest, light; weather fair. Saw several flocks of Semipalmated Sandpipers flying from the southward this morning. Saw several Petrels out in the bay.

July 6th, wind northwest, fresh; weather fair. Saw three large Plovers flying from the flats. Several small flocks of Semipalmated Sandpipers, one single Sanderling and three flocks of Scoters seen. Large Gulls on the increase.

July 7th, wind southwest, fresh; weather fair. Did not go out on the flats. Saw a large number of Gulls on the bars.

July 8th, wind northwest, fresh, changing to southwest, light in the afternoon; clear. Several Semipalmated Sandpipers seen on the flats. Several small flocks of Scoters, and four Petrels seen out on the bay.

July 11th, wind southeast, moderately fresh, with fog most of the day. Several Petrels and a flock of twelve Great Northern Divers seen out in the bay. A full plumaged, or adult, Black Tern, seen in company with some Common Tern. Large flock of Night Herons on the marshes.

July 12th, wind southwest, fresh gale; weather fair. Shore birds noticed were several Semipalmated Sandpipers flying from the flats.

July 13th, wind northeast, moderate; weather clear. Several flocks of Semipalmated, and one of Least Sandpipers seen. Four Red-breasted Snipe and one Red-breasted Sandpiper were among the arrivals to-day. One Greater Yellow-legs heard. A number of birds seen on the flats that I could not identify.

July 14th, wind all ways, moderate; weather fair. Shore birds noticed to-day were six flocks of Semipalmated Sandpipers and one single Hudsonian Curlew.

June 15th, wind southwest, moderate; weather fair. Two flocks, one of six and one of ten Red-breasted Snipe came along to-day. Increase noticed of Semipalmated Sandpipers.

July 16th, wind northeast to east, moderate; weather fair. Sandpipers much increased.

July 17th, wind east, moderate; weather fair. Large flocks of Semipalmated Sandpipers came along to-day.

July 18th, wind east to northeast, moderate, with fog in the afternoon. One Greater Yellow-legs seen flying over the house.* Least Sandpipers common on the salt marshes.

July 19th, wind southeast to southward, fresh, with fog part of the day. A marked increase in shore birds noticed to-day. Saw as many as seventy-five Red-breasted Snipe, the largest flock containing thirteen. Several small flocks of Yellow-legs seen on the flats at the edge of Salt meadows in company with Snipe and Stilt Sandpipers. A few seen on the meadows. Three Stilt Sandpipers in adult or breeding plumage shot while flying to my decoys on the meadows. Several others seen in company with Yellow-legs and Red-breasted Snipe on the flats. Semipalmated Sandpipers abundant.

July 20th, wind south to southwest, moderate. Red-breasted Snipe remain about the same as yesterday. One small flock of Yellow-legs seen. A Hudsonian Curlew heard.

July 21st, wind southeast in the forenoon, changing to southwest in the afternoon, light rains with fog part of the day. Saw several flocks of Red-breasted Snipe and several flocks of Snipe and Yellow-legs together. Eight Red-breasted Snipe collected were all in adult plumage. Large Gulls very much increased. A pair of Hudsonian Curlews seen on the flats.

July 23d, wind southwest, fresh; weather fair. Red-breasted Snipe on the decrease. Other birds remain about the same.

July 24th, wind southwest, fresh, with fog part of the day. Took a long tramp out over the flats. Found Semipalmated Sandpipers abundant. Saw about two dozen Semipalmated Plovers. Other birds seen were two adult Black-bellied Plover, three Bonaparte's Gulls, two Red-breasted Snipe, and a bunch of eighteen Sanderlings.

July 25th, wind northwest to southwest, moderate; weather fair. No new arrivals. Two Red-breasted Snipe seen. Made a visit to the high beach. Found Least Tern decreased since last visit. Should judge that there were some young on the beach from seeing the old birds flying about with fish in their bills. One Greater Yellow-legs seen flying over the meadows.

July 26th, wind southwest, fresh; weather

* House of the Bristol Brantling Club.

fair. Shore birds noticed were several flocks of Semipalmated Sandpipers. Roseate and Common Terns abundant, but no Arctics seen.

July 27th, wind all ways, moderate with rain. Only birds seen on the flats were Semipalmated Sandpipers, Sanderlings and several other birds I could not identify.

July 28th, wind north to northeast with rain. New arrival was a Red-breasted Sandpiper.

August 1st, wind northwest to southeast, fresh, moderating to calm. Saw large flock of Semipalmated Sandpipers about the "cut through." One Turnstone seen on the flats, and a flock of Scoters out in the bay.

August 2d, wind northwest to southwest, very light; weather fair. Sanderlings abundant, Turnstone common, several large flocks being seen. Semipalmated Sandpipers abundant and on the increase. A small flock of Black-bellied Plover three Red-breasted Snipe and several Greater Yellow-legs were noticed at the "cut through." Examined thirteen Sanderlings collected to-day. I found that four showed as much rusty or brown coloration about their throats and necks as the highest colored spring specimens. The others, with the exception of two, show more or less rusty color in their plumage. None in young or winter plumage.

August 3d, wind southwest in the afternoon, moderate, fresh; weather fair. Sanderlings decreased. Least Sandpipers abundant on the meadows. Semipalmated Plover common. Other birds seen were a flock of seven Greater Yellow-legs, a flock of twelve Bonaparte's Gulls and a single one, one Red-breasted Sandpiper, one Red-breasted Snipe, and a large flock and several single Black-bellied Plover. Young of the year, Piping Plover, noticed full grown.

August 4th, wind southwest, very fresh with rain in the afternoon. Saw several small flocks of Black-bellied Plover. Other birds remain the same.

August 10th, wind north to northeast, moderate; weather fair. I have been away from the island since August 4th. During my absence two Stilt Sandpipers, one Hudsonian Curlew, and one Willet have been shot by gunners. To-day found Sanderlings scarce. Semipalmated Sandpipers much decreased, Semipalmated Plover increased, and Black-bellied Plover much increased. Several Red-breasted Snipe and Sandpipers seen, and three Pectoral Sandpipers flew over my stand on the flats.

August 11th, wind northeast, moderate, fresh; weather fair. Birds very much the same as yesterday. Semipalmated Sandpipers collected in the young of the year plumage,

also three Red-breasted Snipe in young plumage. One Red-breasted Snipe was in adult dress. Shot four Black-bellied Plover, one in fourth stage or nearly full plumage, one in third, one in second, and the other in the first or young of the year. Two Willet's seen, also large flocks of Night Herons.

August 13th, wind southeast in the forenoon very fresh with heavy rain, changing to southwest with fair weather in the afternoon. Birds remain the same as yesterday.

August 14th, wind west to northwest, very fresh all day. Spent the afternoon in company with two gentlemen from New Haven on the meadows. A flock of fifteen Greater Yellow-legs was started from the meadow. Six Red-breasted Snipe in young plumage, six or more Yellow-legs, one Greater Yellow-legs, two Pectorals, and one Hudsonian Curlew were taken by our party. Several other Hudsonian or Jack Curlew seen. Least and Semipalmated Sandpipers abundant. Several large flocks of Black-bellied Plover seen flying to the high beach.

August 15th, wind southwest, very fresh. No large birds seen. Black Duck and a Solitary Sandpiper were taken by the New Haven gentlemen this afternoon. Several Petrels seen out in the bay.

August 16th, wind southwest, very fresh; weather fair. No change noticed in the birds. Gunners shot nine Red-breasted Sandpipers on the flats. A White-rumped Sandpiper taken by the New Haven gentlemen. Richardson's Jaegers abundant. Took a ♂ Piping Plover in the adult plumage.

August 17th, wind southwest, very fresh; weather fair. Small increase in Black-bellied Plover. Six or more Red-breasted Sandpipers seen; Several Red-breasted Snipe in young plumage noticed; young of the year, Semipalmated Plover, taken; several Black Tern in the young plumage were seen.

August 18th, wind northwest to southwest, moderate, fresh. Birds remain the same as yesterday.

August 20th, wind northwest to east; weather fair. Several Willets seen; other birds remain the same.

August 21st, wind southeast, moderate, fresh, with light rains. Went up to the high beach. Saw six large flocks of Black-bellied Plover, and several shot were in very dark plumage. Several small flocks of Turnstone were noticed in young plumage. Least and Semipalmated Sandpipers and Plover common on the meadows where several Greater Yellow-legs were seen.

August 22d, wind northwest to southwest, very fresh; weather fair. Did not see many birds about to-day. A small number of Willets seen. A flock of Black Ducks numbering about eight seen flying over the meadows, and some four or five flocks of Black-bellied Plover noticed flying to the high beach.

August 23d, wind northwest, fresh. Saw several Black Terns, young plumage, out in the bay.

August 24th, wind southwest, very fresh; weather fair. Several flocks of young Red-breasted Sandpipers and a small number of Black Terns, young, were seen.

August 25th, wind west to southwest; weather fair. New arrivals to-day were a small number of Pectoral Sandpipers. Several each of Hudsonian Curlew, Black Tern and Willets noticed. A flock of about thirty Red-breasted Sandpipers seen flying over the island.

August 26th, wind southwest, very fresh. Several small flocks of Pectorals seen on the meadows.

August 27th, wind west, very fresh with tempest and light rain in the afternoon. Birds remain about the same. Several flocks of Red-breasted Snipe seen. Several Bonaparte's or White-rumped Sandpipers seen and one taken. An adult Black Tern seen.

August 28th, wind northwest, very fresh, moderating to north in the afternoon; weather fair. New arrivals seen were a large flock of Golden Plover seen flying over the island, and four found on the meadows; a Black-billed Cuckoo shot by Mr. J. F. Whiting.

August 29th, wind northwest to southwest, very fresh; weather fair. Two Golden Plover taken on the meadows. Sanderlings, young, abundant. Several Pectorals seen on the meadows. A Titlark taken by "J. F. W.," which is very early for this bird to arrive at the island.

August 30th, wind southwest, very fresh all day; weather fair. A Solitary Sandpiper taken on the meadow. Other birds remain the same.

August 31st, wind southwest, very fresh, changing to south in the afternoon. A young ♂ Baird's Sandpiper was taken by a New Haven gentleman as recorded in the O. & O., December, 1888.

John C. Cahoon.

O. & O. XV, Apr. 1890 p 49-52.

We have received the Transactions of the New York Academy of Science, Vol. IV, Nos. 1 and 2, October and November, 1889.

REMARKS ON THE ORIGIN OF BIRD MIGRATION.¹

BY FRANK M. CHAPMAN.

AS A TEXT for the remarks I have to offer on this subject I have taken the following paragraph from Dr. Allen's paper on the 'Origin of the Instinct of Migration in Birds': "Nothing

¹ Read at the Eleventh Congress of the American Ornithologists' Union, held in Cambridge, Mass., Nov. 20-23, 1893.

² Bull. N. O. C., V, 1880, pp. 151-154.

influences which may have aided climatic conditions in establishing the habit of migration and which are probably effective in governing it to-day.

Most animals have an instinctive desire for seclusion during the season of reproduction, and when this season approaches will seek some retired part of their range or haunts in which to rear their young. Even our domesticated hens, turkeys, ducks, and pea-fowl, if given freedom, often travel a greater or less distance in search of a place where they may conceal their nests. Many species of tropical sea-birds resort each year to some rocky islet, situated perhaps in the heart of their habitat, where they may nest in safety. This is not migration in the true sense of the word, but nevertheless the object is the same as that which prompts a Plover to migrate to the Arctic regions, and, be it further noted, the movement is just as regular. These sea-birds pass their lives in the tropics, their presence or absence in any part of their range being largely dependent upon the food-supply. But, as in the case of a Warbler which nests in Labrador, they

is doubtless more thoroughly established than that a warm temperate or sub-tropical climate prevailed down to the close of the Tertiary epoch, nearly to the Northern Pole, and that climate was previously everywhere so far equable that the necessity of migration can hardly be supposed to have existed. With the later refrigeration of the Northern regions, bird life must have been crowded thence towards the tropics and the struggle for life thereby greatly intensified. The less yielding forms may have become extinct; those less sensitive to climatic change would seek to extend the boundaries of their range by a slight removal northward during the milder intervals of summer, only, however, to be forced back again by the recurrence of winter. Such migration must have been at first 'incipient and gradual,' extending and strengthening as the cold wave receded and opened up a wider area within which existence in summer became possible. What was at first a forced migration would become habitual and through the heredity of habit give rise to that wonderful faculty we term the instinct of migration."

This theory gives us, I think, as satisfactory a working hypothesis of the origin of bird migration in North America as we can hope to have. The few words I have to say relate to the influences which may have aided climatic conditions in establishing the habit of migration and which are probably effective in governing it to-day.

Most animals have an instinctive desire for seclusion during the season of reproduction, and when this season approaches will seek some retired part of their range or haunts in which to rear their young. Even our domesticated hens, turkeys, ducks, and pea-fowl, if given freedom, often travel a greater or less distance in search of a place where they may conceal their nests. Many species of tropical sea-birds resort each year to some rocky islet, situated perhaps in the heart of their habitat, where they may nest in safety. This is not migration in the true sense of the word, but nevertheless the object is the same as that which prompts a Plover to migrate to the Arctic regions, and, be it further noted, the movement is just as regular. These sea-birds pass their lives in the tropics, their presence or absence in any part of their range being largely dependent upon the food-supply. But, as in the case of a Warbler which nests in Labrador, they

are all affected at nearly the same time by an impulse which urges them to hasten to a certain place.

This impulse is periodic and is common to all birds. There is a regular nesting season in the tropics, just as there is a regular nesting season in the Arctic regions. It is evident, therefore, that external conditions have not created this impulse, though it is possible that in many instances they may have governed its periodicity. On the contrary, its causes are internal. In the case of the sea-birds, for example, dissection will show an enlargement of the sexual organs and it is this physiological change which warns the birds that the season of reproduction is at hand.

The organs of male birds apparently begin to enlarge before those of the females, and it is not improbable that this may account for the earlier migration of the males of many species. Furthermore, individuals found south of the breeding range of the species during the nesting season are generally barren birds, and their presence may be due to an absence of conditions which would impel them to migrate to the nesting grounds.

Now returning for a moment to the period of glaciation, it is not improbable that the period of reproduction may have been coincident with the return of the warmer part of the year and, in addition to the desire for seclusion and the pressure exerted by the crowded conditions of existence which then prevailed, was potent in inducing birds to seek breeding grounds in the north during the summer.

I do not presume to attempt to trace the varied influences of changing climate which, acting with the factors I have mentioned, have brought about the conditions of the avifauna of to-day, with its resident species and transient visitants, but will speak briefly of the two classes of our strictly migratory birds.

These are, first, those which breed continuously from our southern borders to the northern limit of their range; second, those in which an area of varying extent exists between the southern limit of their breeding range and our southern boundaries.

Examples of the first class are *Tyrannus dominicensis*, *Vireo calidris*, *Dendroica virginii*, and *Compsothlypis americana*. I believe the presence of these birds to be due to normal

extension of range. Certainly in the case of the first two there can be no doubt that in this way we can account for their occurrence in the United States. In them we have two abundant West Indian species, which, with a number of others, have become established on our southern boundaries. Whether they will gradually increase their northern range, as others have done before them, will of course depend upon the conditions they encounter. The second two present a similar case carried to greater extreme. The Pine-creeping Warbler nests from Cuba to New Brunswick, the Parula Warbler nests from Florida and Texas northward to Canada, and in its various closely related forms is found as far south as Brazil. These, like the two preceding, we may consider normal instances of extension of range.

In our own experience we have seen how readily a species responds to favorable conditions and how quickly it takes possession of territory adjoining its habitat when the conditions are favorable. These conditions I think are, first, absence of competition with species of similar habits; second, an abundance of food. Temperature I consider of importance only as it affects the food-supply.

The Pine Warbler (*Dendroica vigorsii*) illustrates this. Its habits demand pine forests and it is equally at home during the summer from the pines of western Cuba to those of New Brunswick and Manitoba. Its breeding range, therefore, lies between the summer isotherms of 80° and 64° , — excellent evidence that temperature alone is not the factor which determines its distribution, but temperature as it governs environment.

The Warblers which nest in the Canadian Fauna are good examples of our second class of migrants, or those whose breeding range is entirely north of our southern limits. Here we have species many of which winter in Central or South America and, returning in the spring, pass over thousands of miles to reach the region of their birth. I take it for granted that the members of this second class of more northerly migrants became North American at an earlier period than the members of the first class. This I think is proven by a study of the first class, in which we find species even now entering our limits, and also because it would be unheard of for a species to move its entire habitat thousands of miles, as these Canadian birds would have

had to do if we suppose them to have become North American since the advent of the members of the second class. Doubtless they may once have represented the first class and perhaps at that time all our migrants were confined to our southern borders,—this being presumably the condition of things during the period of glaciation,—but as a gradually changing climate advanced the isotherm which bounded the northern limit of their range, and with it the conditions they required, they followed it northward until even the southern limit of their summer home was carried further north than the northern limit had previously been, except where altitude gave them the surroundings needful to their existence.

As an illustration of how a northern habitat might be acquired I will instance the case of our Common Tern (*Sterna hirundo*) on the Atlantic coast. It is only a few years since this species was an abundant breeder along the greater part of the coast, but a demand arose for these birds for millinery purposes and, as the result, they are now restricted during the breeding season to comparatively few localities. On Long Island, for example, this Tern was a common summer resident but those birds which nested on the mainland were easily accessible to hunters and were soon exterminated, until at present few or no Terns nest on Long Island except a colony of about 1000 pairs confined to the small, uninhabited, isolated islet known as Big Gull Island. On the Massachusetts coast, practically the same thing has happened and Terns are now largely restricted to Muskeget Island.

What has occurred on Long Island and in Massachusetts will doubtless take place throughout the larger part of this Tern's American range. It breeds now from the Gulf of Mexico to the Arctic regions, but is the day far distant when the Common Tern will be unknown as a breeding bird in that part of its present summer habitat inhabited by man? Then its breeding range in America will be a boreal one, and just as the Terns of Big Gull and Muskeget Islands return year after year to the home of their birth, so will these northern breeding Terns return to their Arctic home, and have thus established a habitat similar to those of the birds in the second class of migrants I have mentioned.

But we may learn another lesson from these island-nesting birds.

Their case seems to me to be closely parallel to that of the sea-birds previously cited. It is probable that in both cases these colonies owe their origin to the instinct which guides a bird to return to the place of its birth. Those individuals which selected the most favorable breeding ground would rear their young in safety and the young returning would aid in forming a future colony. On the other hand, the progeny of those birds which did not select so safe a home would be less likely to survive.

Of this wonderful 'homing instinct' which plays so important a part in the migration of birds I have no explanation to offer. We know, however, that it exists, not only in birds, but in many other animals. It is this instinct, aided by the 'heredity of habit,' which guides a bird to its nesting ground. The Carrier Pigeon is taught its lines of flight by gradually extending its journeys; a species learns its routes of migration by gradually extending its range.

As for the desertion of the breeding grounds and consequent fall migration, there seems to be no question that it is due mainly to the failure of the food-supply. Nevertheless, many species of birds migrate long before there is apparently any reason for their doing so. Early in July the Snipes and Plovers begin to appear from their nesting grounds in the north. The first of August finds numbers of our land-birds crossing the Gulf of Mexico en route to their southern homes. Now, it has been frequently asked, if failure of the food-supply is the cause of the fall migration, why do these birds leave their breeding grounds at so early a date? In reply I would ask, why should they remain? The object for which they came is accomplished, and unless they are offered some special inducement to stay, why should they not return to the regions in which—and I would emphasize this—many of them pass two-thirds of the year?

The sea-birds I have mentioned desert their barren homes as soon as their young are on the wing. The Arctic-nesting Snipe and Plover hasten from the north to more fruitful feeding grounds further south. In fact, as soon as the cares of the nesting season are over, the summer home seems to possess few attractions. Some birds at once hurry back to their southern resorts, while others wander at will around the country, pausing wherever food is abundant, and do not retreat southward until they are actually forced to do so.

Among the Migrants at Hamilton, Ontario.

BY K. C. MCILWRAITH.

Two years ago when looking around for out door exercise *with an object*, I turned my attention to collecting birds and making up the skins. I need scarcely say that this has suited my purpose admirably, besides affording a great deal of enjoyment. As many of your readers may be similarly situated to myself I have thought it might interest them to hear the result of one or two short collecting trips which I have recently made with considerable success.

Being at school, Saturday is my only available day, and the second and third Saturdays in May are looked forward to with more interest than any others of the year. This year there was a slight increase in the number of the early species about the 10th of May, but from that date until the 21st, the weather was bright and cool and bird life remarkably still. On the 22d it rained slightly all day and kept on during the night. On

the morning of Saturday, the 23d, the rain had ceased but everything was enveloped in thick fog. I liked the look of the morning very much, and leaving the city at about 6 a. m., drove six miles to a well known point, where I tied up the horse and soon had plenty to do. From the numbers of small birds which swarmed everywhere it was evident that a "wave" had been passing over, but had been delayed by the fog and now the only difficulty was to select the most desirable species. I tried to do this as I best could, but after all brought down some common ones by mistake. I stayed till 11 o'clock, and then returned with the following "bag":

1 Carolina Rail, 1 Scarlet Tanager, 1 Oven Bird, 1 Red-eyed Vireo, 1 Wood Pewee, 1 Yellow-bellied Flycatcher, 1 Swamp Sparrow, 2 Redstarts, 1 Alice's Thrush, 2 Lincoln's Sparrows, 3 Blackburnian Warblers, 2 Chestnut-sided Warblers, 3 Spotted Canadian Warblers, 1 Yellow-rump Warbler, 1 Black-and-yellow Warbler, 1 Nashville Warbler, 2 Bay-breasted Warblers, 2 Green Black-capped Warblers, 5 Mourning Warblers, 2 Connecticut Warblers. The above were collected by two guns between 7 and 11 o'clock.

In the afternoon another of our party visited the same locality and returned at 7 p. m. with 1 Whip-poor-Will, 1 Titlark, 1 Red-eyed Vireo, 1 Short-billed Water Thrush, 4 Spotted Canadian Warblers, 1 Hooded Warbler, 5 Bay-breasted Warblers, 1 Black-throated Green Warbler, 1 Black-throated Blue Warbler, 1 Black-and-Yellow Warbler, 2 Mourning Warblers, 1 Connecticut Warbler, 2 Green Black-capped Warblers.

Sunday the weather was still foggy, and on Monday, the 25th, it began to clear away. This day being Queen's Birthday, and a holiday, I was again at liberty, and with my former companion reached the same point at 7 a. m. and returned at noon with the following birds: 2 Blue Jays, 3 Black-billed Cuckoos, 2 Carolina Doves, 1 Marsh Wren, 1 Indigo Bird, 2 Lincoln's Sparrows, 2 Yellow-bellied Flycatchers, 1 Warbling Vireo, 4 Mourning Warblers, 2 Black-throated Blue Warbler, 1 Black-and-yellow Warbler, 2 Blue Yellow-backed Warblers, 1 Blackburnian Warbler, 2

Green Black-capped Warblers, 2 Black-poll Warblers, 1 Maryland Yellow-throat, 1 Spotted Canadian Flycatching Warbler, 1 Redstart.

Tuesday, the 26th, was bright and clear, the same locality was visited again by one of our party, but except a few Black-polls which were loitering about, all the migratory birds were gone, to be seen no more for a time. We have usually got one or two Mourning Warblers at this point each year but never so many as this time. The Lincoln's Sparrow, Hooded Warbler and Connecticut Warbler are all first records for the locality.

Boston Globe. Jan. 15-99.

THE FLIGHT OF BIRDS.

Railroad Speed is a Trifle, Even to the Little Fellows.

A recent flight of carrier pigeons from the Shetland isles to London brought out a sustained average speed of 37 miles an hour for 16 hours. This, however, included stops for rests and probably a good deal of circling to spy out the way, for a pigeon does not fly straight to the mark.

Better speed was once made from Paris to Spa—250 miles—in five hours, but even this gives no hint of what a pigeon could do over a measured 10 miles. Some authorities put their speed as high as 100 miles an hour.

Sir Ralph Payne Galloway estimates the flight of a teal duck at 140 miles an hour, but this again is doubtless in excess of the truth. It is well known that when gales exceed 40 miles an hour only the strongest flying birds can make much headway against the wind. Any one who has traveled at a mile a minute on the pilot of an engine knows that the air resistance is felt as an almost crushing force.

Audubon once shot in Louisiana some pigeons in whose crops he found rice of a kind which couldn't have been eaten nearer than South Carolina, 550 miles away. From the state of digestion of the rice he concluded that it had been six hours earlier. Hence he figured out a speed of a mile a minute for the whole distance, though manifestly such computations cannot be very reliable. He placed the speed of wild ducks at 45 miles an hour.—(Ex.)

Natural History.

Am. Field XV 11 no 8, Feb. 18, 1882 p. 132

The Migratory Qualls.

BY EVERETT SMITH.

The importation of the common quail (*Coturnix communis*) of Europe, for the purpose of adding to the fauna of North America a bird worthy of the esteem of sportsmen, farmers and epicures, has been attempted within the last few years; and those who have been especially interested in this attempt are now asking if any of the qualls have returned, after migration, to the localities where they were liberated.

My interest in ornithology, and as a sportsman, prompted me to introduce the subject in an address to the "Sagadahoc Association," at Brunswick, Me., in 1879, with the object of obtaining by subscription a general fund for the importation of these birds into Maine. As a result I received 2600 live qualls early in June, 1880, and lots for distribution were sent to nearly every county in the state. In the majority of cases some of the birds nested in the immediate vicinity of their liberation, and many nests with eggs were found. Although some eggs and birds were destroyed by mowing machines, some nests deserted, and many birds captured by the domestic cat, yet it was to be presumed that a good number escaped, and migrated South in the Autumn.

In the Maine "Report of the Commissioners of Fisheries and Game" for 1880, I gave an account of the migratory qualls, their introduction to Maine and results so far as then observed, with some description of their nests, habits, etc.

As none of these birds were imported to Maine in 1881, I looked forward with interest to learn if my confident prediction of their return by migration from the South would be verified. Through the Chicago Field, and by other mediums, I requested all persons who might observe any of these qualls to report the fact to me. And I would be grateful, now or in the future, for any information about these birds, especially of their arrival in the Spring of 1882. The reports received establish the fact beyond a doubt that the qualls have returned. I have received reliable evidence of their appearance in various portions of this state, from the Saco river valley in the west, to the St. Croix river on the eastern boundary. I quote from a few of the reports received:

"DAYTON, ME., May 2, 1881.—The qualls that nested on my place last Summer have returned this morning. Five in number. G. W. RUMERT."

"BATH, ME., May 3, 1881.—Mr. W. T. Dutton saw two qualls last week on his farm, within the limits of this city. C. H. GREENLEAF."

"WISCASSETT, ME., May 9, 1881.—The qualls that I liberated last year have returned. They were seen for the first time on May 5, in the very field in which they were hatched. W. G. HUBBARD."

During the latter part of April Mr. W. W. Castle of Belfast, Me., found several qualls in the immediate vicinity of that city. These were the first reported, and a comparison of dates fixes the early part of May as the date of their general appearance in Maine for that season. Samuel Atwood, Esq., writes from Wintertown, Me., under date of May 24, 1881: "I have for the last two weeks looked early and late and this evening was rewarded with the sight of two qualls, and the sound of quite a number."

The notes of the migratory quail are unmistakable, and not to be confounded with the notes of any of our native birds, and their general appearance and flight differ widely from all Maine birds. Sometimes, when flushed, the migratory quail repeats a low trilling note as it flies away. This note resembles the ordinary cry of the pectoral sandpiper (*Tringa maculata*), but is softer and only to be heard when uttered within a few rods of the listener. But the ordinary notes of the male quail, so frequently uttered at morning and evening, during the months of May and June, are clear and penetrating, and on a still day may be heard at a distance of nearly half a mile. I can best express these notes in words by the syllables *Who-eat, wheat-wheat?* The crescendo *who* of the first note can be heard only when close by. These notes may be easily imitated by a whistle, but they are of a ventriloquist nature, and the listener who hears the rapidly uttered "*who-eat, wheat*" of the two terminal notes at a distance of several hundred yards, is apt to be misled into believing the bird very near.

All the qualls thus far imported have been sent to widely separated districts, and divided into lots of very small numbers for liberation, except the importation of 1880. A total of 5,100 qualls were imported to America in that year, and more than one-half of the whole number came to me, and were distributed throughout Maine. Not a large number for the territory. Eight hundred qualls were sent to Canada in 1880, and distributed in small lots of a few pairs each over a wide extent of country. Colonel Wm. Rhodes, a public-spirited gentleman and sportsman of Quebec, liberated a number at his own private expense, and in an interesting letter, giving me the memoranda of their distribution, expresses the hope that these qualls may find "the great barrens of the Laurentides" suitable for their breeding. It is my belief, however, that the cultivated fields of the St. Lawrence valley are more favorable, and in character and latitude highly suitable as a home for the migratory quail.

It is impossible to predict with certainty the ultimate success of the attempt to make the migratory qualls a permanent addition to our fauna, but it has already been demonstrated that these birds find suitable food in abundance here, and that they are not lacking in the instinctive love of home that pertains to all creatures, and prompts migrating birds to return to the place of their nativity.

I am confident in the belief that these qualls can be permanently added to our North American fauna, even should the first attempts fail. In this connection I will mention the fact the first attempt of which there is public record, to introduce the domestic sparrow (*Pyrrhula domestica*), of Europe to this continent was made at Portland, Maine. But the birds then liberated here were few in number, and although they were observed for several years, all finally disappeared, and it was only after repeated attempts that their introduction as permanent residents was accomplished. As regards the migratory qualls, it should be borne in mind that they are terrestrial birds, rarely alighting elsewhere than on the ground, and their brown plumage protects them from ready detection in the grass. Moreover, these qualls are not easily flushed, and one may pass very near while the birds seek safety by running or hiding in the grass. Hence there might be but few seen even where abundant, and to become appreciably noticeable throughout a territory extending from the Atlantic Ocean to the Mississippi river, their numbers must be millions. These qualls are so prolific, laying from eight to eighteen eggs in a nest, that if the attempts made prove successful we need wait but a few years for the few thousands imported as seed to multiply to millions.

From what I have written above it may be perceived that the migratory qualls liberated here have nested, raised their young, and with them migrated South, and returned in the Spring.

Portland, Maine.

Chicago Field No 6 Mch. 25, 1879 p. 90 Importation of Migratory Quail.

RUTLAND, VT., MARCH 18.

EDITOR CHICAGO FIELD.—I beg leave to draw your attention, and, through your paper, the attention of sportsmen, to the fact that by the 1st of May next there will reach this place one hundred and fifty pairs of migratory quail, to be turned loose on our mountain pastures, in the hope that they will find on our continent all the conditions fit for their summer and winter homes. The quail is perhaps the most valuable of the migratory birds of Europe. It is exceedingly prolific; it yields to the sportsman in the countries over which it passes, two seasons for shooting, like the English snipe; and, like the snipe, moves over great breadths of country. It has no such strength of wing or durability of flight as the snipe or pigeons. The crossing of the Mediterranean well-nigh exhausts it.

This quail is a capital bird for the table; its well to the open; is found mostly in the open, and, indeed, is in every particular except size, nearly as fine a bird as our "Bob White." It resembles in general color and markings the female of its Virginia congener. To appearance it is larger-bodied and shorter-legged in its proportions.

The great object of this importation, made by Judge M. G. Everts, of this place, is to furnish, if possible, to those living on the northern borders of the canon, and too far north for the Virginia quail to winter well, a species, breeding still further north and giving us a whack at them perchance as they go by in spring and fall.

If this handsomely conceived and spiritedly executed project of Mr. Evert's succeeds, he will have caused not only to congratulate himself and neighbors, but to feel that he has done a lasting benefit to the country.

Very truly yours,

M. GOLDSMITH.

GAME DESTROYING HAWKS.

Am. Field, XXIX, No. 1.

Jan. 7, 1884. P. 7.
GREENSBORO, ALA.

EDITOR AMERICAN FIELD:—In the issue of the AMERICAN FIELD of December 17, in an article entitled "Hawks in Deadly Combat," M. M. R. says: "I make it a rule to kill every hawk I can, and if all sportsmen would do the same, I think we would have more quails."

I will enumerate the hawks that ought to be shot by sportsmen: The blue darters, as they are commonly called, are most destructive of game. Of these there are two: Cooper's hawk (*Accipiter cooperi*), and the sharp-shinned hawk (*A. velox*). I believe no hawk to be more legitimate objects of pursuit by every sportsman than these two accipitrine hawks. They with the gos hawk (*A. atricapillus*), which should also be shot on all occasions, may be easily distinguished by the observant sportsman from other hawks. Their manner of flight to the experienced eye is sufficiently characteristic to identify them, as far as they can be seen. The tail is long compared to the wing, which is short and rounded. When in pursuit of their prey, unlike the falcon, which soars at great heights, they fly rapidly in a straight line a few feet above the ground, taking the advantage of any rising ground or hedge, or any obstacle which may present itself, to conceal their attack upon their quarry. I know this to be especially true of Cooper's hawk. These cunning hawks, in spite of the fact that I bagged six, besides wounding a number of others in and around my yard since the 1st of last March, have captured and carried off to my certain knowledge over a dozen of my tame pigeons.

My house is surrounded on the east and south by a pine grove, while a row of tall cedars obstructs the view on the north side of the yard. To give the reader some idea of the audacity of Cooper's hawks, I will relate a deed of daring of one of these marauders, which occurred during the Summer. The cackling of the fowls in the pine grove announced the presence of the hawk. I had hardly time to arm myself and step to the door, when he shot like a flash across the yard; but missing his bird this time, he passed on to the row of cedars and concealed himself again. I stood still, awaiting the denouement. The terrified pigeons circled around for perhaps half an hour, and seeing nothing of their foe they lighted again upon the roof of the pigeon house. They had hardly settled when the hawk made another rake at them, and, as he passed over the gable end of the house, just too late, I sent a charge of No. 8 shot after him, and repeated the dose as he came into view about seventy-five yards beyond the house, and circled over the pine grove. I missed him this time with both barrels, and he missed his pigeon; but so satisfied was I that he had been frightened away by the firing of the gun that I gave the matter no further attention. The hawk however, was not gone; he had again concealed himself in the pines. The pigeons, as usual, had surveyed things below and thinking perhaps danger threatened them no longer, they pitched again upon the house. No sooner had they lighted than I heard a rush of wings, and hastening to the door I saw the hawk close behind the pigeons as they passed around the house out of sight. I seized my gun, and ran to the front door when, about fifty yards from me rose, among the pines, the rascal with a young pigeon in tow. This pigeon was the only survivor of a happy family that had had their domicile against the gable end of the kitchen—father, mother and brother had been captured by the hawks and now, before my very eyes, my little pet was borne off. Both the old pigeons having been caught, I had reared their starving orphans with my own hands.

My pigeons have not been molested by hawks since the middle of October. From the 1st of March to the middle of October not a week passed that Cooper's hawk did not visit my pigeons, and during all that time no other species of hawk disturbed them, except a peregrine falcon, which was beginning to stoop at them, one day, when a charge of shot whizzed so near his head that he reconsidered the matter, and towered again to survey other parts for his prey.

There are two more hawks, which I have not enumerated among those which sportsmen ought to kill: The peregrine falcon (*Falco peregrinus anatum*), and the pigeon hawk (*F. Columbarius*). These hawks are rare here. Twice, in an experience in the field of forty years, I have had the peregrine falcon to stoop at birds at which I had just shot: once at a partridge (*Colinus virginianus*) and once at a wounded willet. I have seen the pigeon falcon, on several occasions, in pursuit of wild pigeons; but these falcons are so seldom met with that they cannot destroy a great deal of game, though nevertheless they should always be shot if possible, when seen.

There are other species of falcons which I believe prey upon birds, with the exception of the sparrow-hawk (*F. sparverius*) which feeds mainly upon insects.

The sportsman who does not know the game-destroying hawks should make himself acquainted with them. He should not destroy indiscriminately every hawk that crosses his path. Rarely do the *butorininae* (buzzards) prey upon fowls or game. Their food is insects, reptiles and small quadrupeds. They are not swift enough of wing to capture a bird, and very few birds, if any, which can save themselves by flight will sit still and allow a buzzard to pounce upon them. Any sportsman who will make himself acquainted with the food of hawks, by examining the contents of their stomachs. If he will do so he will soon be convinced that he is accomplishing no good but, on the contrary, much harm "by making it a rule to kill every hawk he can." No! many species of hawks are the friends of the farmer, and should not be destroyed. They are to the fields what the domestic cat is to the house. Great harm may be done by their destruction; we should distinguish our friends from our enemies.

W. C. A.

HAWKS AND OWLS.

Am. Field, XXIX, No. 11, March 12, 1884. p. 227

U. S. DEPARTMENT OF AGRICULTURE,
WASHINGTON, D. C.

EDITOR AMERICAN FIELD:—I notice with regret an article on page 171 of your issue of February 19, by Quail, suggesting that gun clubs should unite in endeavors to influence the legislatures of the several states to pass bills offering premiums on birds of prey.

A more unfortunate and lamentable proceeding could hardly be suggested than this movement to secure laws granting bounties on hawks and owls, for obviously the destruction of the natural enemies of our small rodents would be disastrous in its reaction upon agriculture. This is especially true in the large sections of country which are infested by meadow mice and gophers, where even a slight reduction in the number of hawks and owls would make it a question whether the harvest could be made with profit or loss.

To those who have studied the food habits of our rapacious birds, it is a matter of wonder that, in this enlightened age, men will advocate the wholesale destruction of the farmer's most useful allies for keeping in check the above-mentioned pests. Pennsylvania has paid bounties on hawks and owls for the past two years, and will unquestionably suffer severely through the short-sighted ignorance of its law-makers, or their constituents.

Fortunately this law has been repealed through the perseverance of Dr. B. Harry Warren, Ornithologist to the Pennsylvania State Board of Agriculture, in setting the facts before the public.

Of the sixteen or seventeen species of hawks inhabiting the Eastern United States, there are four only, which, in the opinion of ornithologists, should be persecuted on account of their depredations on poultry and native birds. One, the goshawk (*Accipiter atricapillus*), is a northern species seldom seen in the United States except in the Fall and Winter; another, the duck hawk (*Falco anatum*), is so rare that it may be dismissed with the mere mention of its name.

Consequently two species only, the sharp-shinned and cooper's hawks (*Accipiter velox* et *A. cooperi*) are all that our farmers and sportsmen need look upon with suspicion. Small rodents (meadow mice and gophers) and insects form a large proportion of the food of all the other species; poultry and native birds, a very small proportion. Owls render as valuable service by night as hawks do by day—probably even greater—for most small mammals are more or less nocturnal and hence are abroad in greater numbers during the owl's hunting hours. The Great-horned owl frequently does kill poultry, but the loss thus occasioned is offset by the good it does in destroying injurious rodents.

The investigations of Dr. B. Harry Warren, who has examined a greater number of hawks' and owls' stomachs than any other person, prove that a very small proportion of these birds prey upon poultry or game, thus substantiating the experience of ornithologists at large. Our own investigations here at the Department of Agriculture, show that over ninety per cent. of their food consists of mice and insects; and if we could eliminate the bird-eating hawks (the sharp-shinned and cooper's) the percentage would be still greater. Why not with equal pertinence offer a bounty on mocking-birds? They undoubtedly do some harm, though who would advocate their destruction? If sportsmen's associations and private individuals would use their influence to secure the passage of laws prohibiting Spring shooting, and shooting in early Fall, when birds are too young to fly, and would reduce the number of vagrant cats, then birds would be so plenty that the few caught by hawks and owls would be unworthy of notice.

DR. A. K. FISHER,
Assistant Ornithologist.

HAWKS AND OWLS.

Amer. Field, XXVII, No. 17. — Apr. 23, 1887. p. 392.
TORONTO, OHIO.

EDITOR AMERICAN FIELD:—I read with a good deal of interest Dr. A. K. Fisher's reply to Quail, in your issue of March 12, in which he strongly condemns the killing of our birds of prey. I trust you will kindly pardon this somewhat late reply as I must plead as an excuse, therefore, an urgent press of business. To begin, I wish to say that I do not claim to be an ornithologist by any means, but my power of observation is fairly good, and I do not know that our horned owl (*Bubo virginianus*), such as is common in Eastern Ohio, not only kills poultry "frequently," as the Dr. puts it, but do it every time they can possibly get a chance. That more poultry is not killed by them is simply due to the fact that they are relentlessly destroyed by the farmers and sportsmen whenever the opportunity offers, and the result now is that they are very scarce and proportionately shy of their deadly enemy, man. Such being the case one would suppose from the Doctor's reply that our farmers are about to abandon their farms to the vast army of small vermin which are here as a natural consequence of the practical extermination of the owl. I trust the Doctor will not be surprised, however, when I say that there is less small vermin to-day than there was twenty years ago, or at least no more. I do not deny, however, that our owls, to some extent, do subsist on the small vermin, but I venture the assertion, the Doctor to the contrary notwithstanding, that they find their chief subsistence on birds—game and otherwise; and I have not the slightest doubt but that a great many of the readers of your valuable paper will bear me out in this assertion. Did I not so greatly fear the anathemas of the Doctor, I would say that our polecat (*Putorius fuscus*), raccoon (*Procyon lotor*), and opossum (*Didelphys virginiana*), had more to do with the keeping down of the smaller vermin, than all the hawks and owls in existence.

It seems to me the Doctor advances an argument in his communication that works similar to a boomerang in the hands of a novice. He says: "Owls render as valuable service by night as hawks do by day, probably more so, for most small mammals are more or less nocturnal, and hence are abroad in greater numbers during the owl's hunting hours."

Let us see what is in this argument. Owls are nocturnal in their habits; so are the greater portion of our small vermin, and both are abroad in search of prey. Now, did it ever strike our worthy Doctor that these small mammals are just as competent to take care of themselves after night as the owl is to catch them? There is not a more awkward bird on earth than our horned owl while on the ground, while his awkwardness is only equaled by agility of most of our small mammals. Such being the case, is it likely that the owl is going to exert himself very much in effecting their capture, when, from darkness until daylight, the greater part of the feathered tribe is completely at his mercy?

The Doctor in one breath admits they frequently kill poultry, while in another he claims they are the "farmer's friend." I am unable to see how he can reconcile these statements, unless it would be on the principle, that if a farmer was to kill a wolf while in the act of carrying off a lamb from his neighbor's flock, he would be justified in appropriating to his own use the mother of the lamb as a compensation for his services to his neighbor.

To show that even eminent authors differ from the Doctor in his views I quote from "Wood's Natural History" the following, relative to this species of owls: "The Virginian eared-owl is found spread over the greater portion of North America, and in former days did great damage among the poultry of the agriculturists, being a bold as well as a voracious bird. Now, however, the ever ready rifle of the farmer has thinned its numbers greatly. It is a terrible destroyer of game, snatching up grouse, partridges, hares, ducks, sparrows, squirrels and many other furred and feathered creatures, and not unfrequently striving after larger quarry."

In conclusion would say that I shall have nothing to say in this article relative to hawks, except that I shall still cultivate the habit of shooting them as the opportunity offers.

H. L. A.

HAWKS AND OWLS.

Am. Field. XXVII. No. 22.

May 22, 1899, p. 528.

WINSLOW, A. T.

EDITOR AMERICAN FIELD:—Notwithstanding the fact that it seems to be "the thing" among the correspondents of the AMERICAN FIELD to take up cudgels in defense of a majority of the species of hawks and buzzards, I intend giving a few instances of the game destroying propensities of several birds which one or two writers have tried to whitewash.

In May, 1880, while riding from Albuquerque, N. M., to a ranch on the Rio Parco, I saw a Ferrugineous buzzard (*Archibuteo ferrugineus*) dash into a clump of sage brush which stood about fifty feet from the trail. In a moment a jackrabbit emerged with the buzzard riding on his back; inside of fifty yards the hare fell, and the hawk began his meal, which I soon terminated.

In the Fall of 1881, while snipe shooting near Albuquerque, my dog stood; I flushed and killed a snipe; at the report a queer looking bird, with what appeared to be two bodies rose slowly from the grass and fell to my second barrel; on going up to it I found a pigeon hawk (*Falco columbarius*) whose claws yet grasped the head of a warm newly killed Wilson snipe. That same Winter I killed a red-tailed buzzard (*Buteo borealis*) which was feeding on another snipe.

In December, 1882, I flushed near the same town a bevy of scaled quails (*Callipepla squamata*); they pitched about one hundred and fifty yards away and began to run. While my dog was retrieving the two I had killed, I saw, much to my surprise, two marsh harriers (*Circus cyaneus hudsonius*) glide up and pitch into the midst of the bevy. Of course the quails scattered and flew clear out of sight. The hawks, however, remained on the ground. I walked up to within ten yards, saw that each hawk had his quail, and shot them both. Up to that time I had no idea that the marsh hawk ever bothered quails; since then, however, I have killed them while feeding on both quails and snipes, and now never let one go.

In December, 1884, while shooting scaled quails near McCarty's Station on the A. P. R. R., I killed no less than four hawks, which appeared from among the cedars at the report of my gun and seized the fallen birds; they were: one sharp-shinned hawk (*Accipiter fuscus*), two Lanier falcons (*Falco mexicanus*), and one Ferrugineous buzzard.

This past Winter I have killed five red-tailed hawks whose crops were full of fragments of rabbit meat.

Of course the larger falcons are individually more destructive, but taking into account the fact that they are not plentiful and also are not Summer residents, I consider the marsh hawk and large buzzards much greater pests than they are.

In the way of birds not strictly game I have seen marsh hawks kill yellow-legs, rails, and several small sand-pipers.

In the owl line of course the great horned owl (*Bubo virginianus*) kills everything or anything he can master; but I have, in the early morning, twice flushed the short-eared owl (*Asio accipitrinus*) from the remains of quails and have found the flesh and feathers of the same in the owls' crops.

The evidence to me is conclusive, and barring the sparrow hawk I never spare either hawk or owl. INDEX.

HAWKS AND OWLS.

Am. Field XXV 11, No. 16. April 16, 1887, p. 367.
GREENSBORO, ALA.

EDITOR AMERICAN FIELD:—It is amusing to see some sportsmen carrying shells loaded with No. 5 shot to shoot every hawk they see. Many harmless and useful birds are thus destroyed.

Dr. Fisher has already informed the readers of the AMERICAN FIELD what hawks prey upon birds, and are consequently destructive of game. For giving this useful information, it has been said: "He takes a bold stand in favor of hawks and owls."

It is unfortunate that the word buzzard, meaning properly the heavy, broad-winged hawks, seen often moping for hours at a time upon dead trees, or sailing slowly over the fields, should be erroneously employed to designate one of our vultures—the turkey-buzzard—which is no more buzzard than turkey. The buzzards, with rare exceptions, prey upon small quadrupeds, frogs, reptiles and insects. I once shot a buzzard, the stomach of which contained a number of leeches.

The red-shouldered hawk (*Buteo lineatus*) is the only buzzard which I ever knew to catch a quail, and my experience in the field extends over many years. I was riding one Sunday with a friend, when I saw a red-shouldered hawk feeding upon a bird of some sort. Curious to know what the bird was, I borrowed an old musket from a negro, and shooting the hawk, I found that his quarry was a quail.

My experience corroborates the statement of Dr. Fisher that Cooper's hawk (*Accipiter cooperi*) and the sharp-shinned hawk (*Accipiter velox*) are the only hawks (with the exception of the falcons and goshawk) which habitually prey upon birds. My knowledge of this fact is the result of observation in the field, the goshawk excepted whose history I know from what I have read, while the Doctor has obtained his information in a way not less sure, that of actual inspection of the contents of stomachs of hawks.

These blue-darters, as they are commonly called here, never delay to catch a mouse any more than the duck hawk (*Falco peregrinus anatum*) would stoop from the cold bosom of ether to bear off quarry so insignificant.

It has happened to me many times to come upon Cooper's hawk with a bird from the covey that I had scattered a few minutes before. I never let this marauder pass without a shot; but I would not walk twenty steps out of my way to shoot a buzzard; in fact, I would not shoot him at all, if I could "identify" him without killing him. Reader, did you ever see Cooper's hawk dart into a covey of birds, when you had flushed them? How Bob White screams (if I may use the word)! how he fears his terrible enemy. Every individual of the covey joins in this chorus of dread alarm, and every one is scattered to the four winds. You may hunt in vain for them. If you find them, they lie so close that you have to tread upon them before they rise. Twenty ten-bores might belch their thunder at them, and they would not be half as much frightened as they are at the sudden appearance of that hawk. Where does Cooper's hawk come from, so often that he seems some days to be ubiquitous? He is not guided by sight alone; he hears the whirr of wings, the "*saave qui peut*," the bang! bang! he meets Bob White half way; and then

"What a panic's in 'his breast!'"

This rapacious hawk does not confine himself to birds alone; domestic fowls and pigeons frequently fall a prey to him; he will return day after day to the same place, till he has carried off every chicken of a brood. A short time ago, on returning home one day, I saw a pile of feathers under the pigeon house. I thought at first that a cat had caught a pigeon and eaten it there. A few hours after a negro boy informed me that a hawk had just flown out of a cedar tree not a hundred yards from the pigeon house. I seized my Lefover hammerless, slipped into it two shells loaded with

four drams of Hazard's FG powder, and one and a quarter ounces of LeRoy No. 8 shot, and started out. The boy directed me to the spot where he had seen the hawk light. Before I was within seventy-five or eighty yards of the tree in which he was perched, the hawk flew; fortunately I had a defective shell in my right barrel, and my gun failed to fire. He lighted again several hundred yards off in a row of cedar trees. I marked as well as I could the place where I saw him pitch. I then approached under cover of the trees, as near as I thought I could go, without being seen by the hawk, and sending the boy on the opposite side of the cedars, I told him to scare the hawk out to my side of the row. My maneuver succeeded perfectly. Soon I heard a flutter of wings among the cedar boughs, and I had a clipping right quarterer, and scored a clean kill at forty yards. This was an adult, and the largest of the species that I ever saw. His talons were still bloody, and bore unmistakable traces of his having caught my pigeon.

The sharp-shinned hawk, known also by the name "blue-darter," preys mostly upon small birds, sparrows, thrushes and the like. His scientific name, *velox*, is appropriate, no hawk, the falcons accepted, being swifter than this little hawk. He is similar in color to Cooper's hawk, but much smaller, being a miniature likeness of the latter.

The goshawk (*Accipiter atricapillus*), known commonly as the blue hen-hawk, is more powerful even than Cooper's hawk. I have never shot one of the goshawks, though I believe I once saw one. They are found in more northern latitudes. The goshawk belongs to the same genus as Cooper's, and the sharp-shinned hawk; his habits are the same; his flight and method of capturing his prey are similar also. He is equally destructive of game, and consequently every sportsman should have a shell loaded with No. 5 shot for this marauder, and not waste his time (as I have seen some sportsmen), trying to stalk every ignoble buzzard that crossed his path.

While shooting in the field, I have once or twice been suddenly surprised by the appearance on the scene of the peregrine falcon, or great duck-hawk. Somewhere out of sight far above the reach of vision, he floats in the sky:

Despicens mare velivolum terraque jacentes.

I had scattered a covey of birds one day in a patch of sedge grass, at least a half a mile from any woods. My dog pointed a bird; I flushed it and missed. A peregrine falcon fell like a thunderbolt from the clouds, and overtook Bob White, but, like myself, the falcon scored a miss, just grazing the back of the frightened bird, which escaped the leaden missiles hurled at it, and then the sharp talons of the hungry hawk that followed in their wake. It would have been downright murder to disturb this bird again that day. I marked him down; but I did not try to flush him again.

On another occasion, I was shooting and had just entered an old field, where I heard the cries of the always noisy killdeer flying wildly overhead. At the same time, I saw a hawk flying far below a killdeer. It was a peregrine falcon; his long, pointed wings beat the air with quick, powerful strokes, while one eye was turned upwards on the incoming killdeer. Lancaster can perhaps tell us how the hawk shot up, swift as an arrow, cutting the flight of the killdeer at right angles, and seizing the bird in his extended talons as he passed up. Edisto could not have calculated better the distance to hold ahead, than *Falco p. a.* did in this instance. Suffice it to say that the killdeer flew into the claws of the wily falcon, which bore his quarry off about a hundred yards to the top of a tall oak. Not many minutes elapsed before I was standing under the tree. A charge of No. 8 shot was launched at the falcon; the killdeer fell from his grasp; he dropped to the underside of the limb on which he was perched; hung quivering there a few seconds and then followed his dead quarry to the ground. W. C. A.

CARE OF NEST AND YOUNG.

BY FRANCIS H. HERRICK.

THE sanitary condition of the nest is a matter of great concern to birds, who, as a class, are probably the cleanest of animals. This is especially true of all who breed in holes like Woodpeckers and Chickadees, the young of which are piled up in close quarters and often more than one layer deep. The Woodpecker's hole and the Bluebird's nest are always sweet and clean, and the nestlings immaculate. The parent bird not only ceaselessly carries food to the young, but is often seen hurriedly leaving the nest with a small white package in bill, an action full of significance to every member of the family.

The excrement of the nestlings of Woodpeckers and Passerine birds is surrounded by a transparent sac of mucous, which is probably secreted at the lower end of the alimentary canal, and of such consistency as to allow of its being picked up without soiling bill or fingers, a condition which undoubtedly occurs to some extent in other orders of birds. The Bluebird carries these packages several rods from the nest, and presumably drops them. Many other birds probably dispose of them in this way, but it is not commonly known that others, among which I can now certify the Robin, Cedar Waxwing, and Red-eyed Vireo, devour the whole or a part of the excrement at the nest.

The Robin has undoubtedly been seen by many in the characteristic pose shown in one of the photographs standing on the brim of the nest, and usually with head inclined, as if dotting on her young and thinking what fine children they are, when this attitude is really one of sanitary inspection. Shortly after feeding, the nestling becomes very uneasy, raises itself to its full height or tries to do so, and when possible drops the excrement over the edge of the nest. The old bird follows every movement, snaps up the excrement the moment it leaves the body, and either swallows it immediately or carries it away. When seen flying from the nest with head slightly depressed and beak outstretched

the Robin is usually engaged in errands of this kind. In considering such actions I refer particularly to the three species mentioned, which I have watched repeatedly at a distance of two feet or less for hours at a time.

Young Robins are fed and cared for by both parents. I have seen the mother Robin remove the excrement from the nest, devour it, and a moment after take it directly from the young and carry it away. Again, on the following day the same bird, after swallowing all the available excrement, fell to brooding her young and remained in this position full twenty minutes by the watch without showing the least desire to reject anything which had been eaten. I have seen the female Cedarbird come to her nest of five half-fledged young, regurgitate black cherries, and after distributing them, inspect her household with the closest attention, picking up and swallowing every particle of excrement. This mother then spread her wings over her brood, and shielded them from a hot August sun for over an hour. Meantime the male came repeatedly, and passed cherries around. The female who stood erect, straddling the nest, would occasionally inspect her brood and devour the excrement. She would also snap at every passing insect, and I saw her catch a large red ant, which was quickly transferred to the mouth of a young bird. She would erect and lower her crest, stand with mouth agape for long intervals, but there was never a sign of ejecting what had been eaten.

After watching such behavior, which I have seen repeated with slight variations many times, I am convinced that the excrement is actually and definitively swallowed, and not merely taken into the gullet to be regurgitated later. The Cedar Waxwing, however, uses its distensible gullet as a temporary receptacle for food, and it is possible that in this species the excrement goes no farther than the oesophagus, from which it is later ejected. The actions of the bird just described, however, do not favor this idea.

Not only is the nest carefully cleaned, but Robins and Vireos energetically pick their young all over, a very important function, since the minute swarming particles which infest birds' nests, known as bird lice, often cause great discomfort, and especially to the young when weakly.

Cleanliness is an imperative instinct with such birds as the Kingfishers and Bank Swallows, whose nests are placed in the ground, while Barn and Eave Swallows, House Sparrows, and Pigeons represent a considerable number of other species which secure protection by placing their nests in remote, high, or inaccessible places. While their nests may be clean, the ground beneath them usually is not.

It is plainly advantageous for birds which breed on or near the ground to remove every particle of litter which would stain or whiten the leaves and surrounding foliage, and thus advertise the secret of their nest to enemies, even to those who prowl after dusk. When a Red-eyed Vireo, whose behavior I studied at close range, dropped any bit of excrement by accident, she darted after it with such speed that it was snatched up before reaching the ground, or before falling a distance of four feet. Not a trace of defilement is ever seen around the dwellings of any of these birds.

On the other hand, predaceous species like Hawks pay no attention to such matters. The excrement of their young is voided in a semi-fluid state and in a peculiar manner. With tail turned to the edge of the nest the bird shoots it off to a distance of two or three feet, and it may strike the ground six or seven feet from the nesting tree. The only significance which such actions have is that of keeping the nest clean. The advertisement of the nest stains on the leaves below is a matter of indifference to these bold and persistent outlaws, who have little to fear from any enemy save men.

Owls, who breed in holes in trees, are reported to have filthy nests, especially where the cavity has been in use for several successive years, but this seems to be due to the remains of their quarry and to the accumulation of rejected food-pellets rather than to the presence of excrement.

The haunts of certain sea fowl are often reeking with filth during the breeding season, and the guano beds of the South American coast mark the places of assembly and probably of the breeding of myriads of sea fowl for long periods of time. However, the birds themselves and their nests are generally clean, and any other condition in the case of most birds would soon become intolerable.

The cleaning of the nest and young is apparently instinctive with the adult bird, and so is also the care with which many avoid soiling the ground and foliage about their nesting sites. They apparently have no choice in these matters, but act because they must. As to eating the excrement, however, it is not so clear. We need many more observations on different individuals before a decision can be reached. If it should be proved that in the Robin, for instance, some individuals never eat the excrement while others do, as we know, we might regard the action as an acquired habit. When the pellicle breaks in the mouth, an accident which I have seen happen in the case of a Robin, the bird must swallow some part in order to get rid of it. Moreover, since digestion in the young is an imperfect process, the substance may serve as a kind of predigested or partially digested food, which might be acceptable to the old birds in times of stress, as in prolonged and heavy storms when food is not easy to procure.

The fact that the Robin removes a part of the excrement from the nest but devours the remainder would seem to imply either that it discriminates what is suited for food, which is improbable, or that this action is a habit not yet fully established, and certainly not ingrained.

DESCRIPTIONS OF PHOTOGRAPHS.

Plate II, Fig. 1. Female Robin inspecting nest. Fig. 2. Male Robin cleaning nest. (In act of swallowing excrement removed from nest; the adherent dead grass is from nest lining.)

Plate III, Fig. 1. Female Bluebird carrying food to young. Fig. 2. Female Bluebird leaving nest hole in act of cleaning nest. (Photographed at a distance of 18 inches.)

Sanitary Habits of Birds.—I read, in the April Auk, Mr. F. H. Herrick's article on the sanitary habits of birds and was much pleased and profited by it. I was disappointed in one respect only—that was that it did not throw any confirmatory light upon a recent observation of my own which had puzzled me a little.

Late last summer I was watching a pair of Baltimore Orioles feeding their young, when I saw the male take a soft white pellicle from the open and extended mouth of a nestling, and drop it some yards from the nest.

This was new procedure to me, and I began at once to review the subject of feeding habits, as it was noted in my scant library, but I could find nothing about it. While I was about to doubt my own eyes (at thirty feet through a good opera glass) I received a letter from Mr. H. B. Rugg, of Vermont, saying that some friends of his had been watching some Robins as they fed their young, and had seen the parents take some round white substance from the throats of the nestlings; and they wanted him to tell them what this was. Then he wrote and asked me what it was.

It seemed quite a coincidence that he should pass this query on to me just when I was suffering for similar information, but it confirmed my observation. Since it is well known that pellets of indigestible things are frequently thrown up by some young birds, the best that I could suggest was that this might be these same things, which, in regurgitation, had taken on the form of the usual dejections; but not being able to see any of these pellicles after they were dropped, I, of course, could not be sure. Cannot Mr. Herrick, or some close student of the habits of birds tell us something of *this*?

I had hoped to observe further before mentioning this, but my opportunities are very limited: so I concluded that I had better note it in the July 'Auk,' so that the host of nest watchers this season may, if they please, be on the lookout for the matter. So far this year I have seen nothing of the sort in casually watching two nests of Robins in my yard.

By the way, the male Oriole noted sometimes regurgitated food to the young, but the mother always came with a particle showing in her mouth. Mr. Herrick's observation that the parent ate the dejected pellicle was new and interesting to me; for, on the contrary, I have seen the Cardinal and others assiduously wipe the beak on a twig, as if the performance had been disagreeable; but then this occurs after food is taken, as well. I have noticed that the little Social Sparrows (Hair-bird) may have one place of deposit for the pellicles. For one brood they used the dead limbs of a plum tree exclusively, and none was ever dropped on the way.

There is a large field here for further observation. Let us hope for more of this, and for something further on this special topic.—JAMES NEWTON BASKETT, *Mexico, Mo. Auk*, XVII, July, 1900, pp. 255-300.

Boston Transcript

FRIDAY, JANUARY 15, 1904

ONE WAY TO SAVE THE BIRDS

[From the Florida Times-Union and Citizen]

The Times-Union gratefully acknowledges the receipt of letters indorsing its proposition that Florida go into the business of supplying the demands of fashion for plumes. There is no sense or economy in relying on the uncertainties of hunting and the wasteful killing of the bird when a simple plucking will serve every purpose, and here in the native climate and under natural conditions we have ideal conditions for securing success. By covering some of our wide marshes with wire netting each tide would bring food to the prisoners, who would soon grow entirely domesticated, and after establishing a rookery they could be allowed to take a wider range with the absolute certainty that they would return if alive—passing out by a gate which could be closed when the plucking was to be done. But they would be entirely happy and contented within the enclosure, provided a proper location were secured.

The trouble with these birds has been the labor of bringing their food to them and of keeping the premises clean. With the accessibility to tide water they could care for themselves—an artisan well would furnish the fresh water required. Let the fresh water escape through the marsh, the well being on higher ground where the houses for the keeper could be placed. In connection a chicken ranch could be established, for the plume birds would require very little attention. The wire netting could be extended as the multiplication of the flock progressed, but these birds are all gregarious, and there would be no objection to numbers except on a very large scale. The marshes would cost very little—they are now strictly waste lands. Within the netting they would be protected from all their enemies, and their nests are built in the shrubs indigenous to the marshes and generally found there. In any case, they would grow as soon as protected from cattle and fires.

The business is one that would require little outlay in money. The young of many species could not be easily secured without delay—the egrets and cranes are still to be found in their old rookeries, though the number has greatly decreased. The spoonbills and flamingoes could be secured in time and at more expense, but we still have them with us or could bring pairs from South America. All would soon be entirely domesticated as far as would be desirable—within a few months after capture they become as fearless as Leghorns.

Fifty acres of marsh land inclosed by wire netting would afford abundant range for five thousand birds, provided the field was covered by a good tide—the birds would feed themselves as easily and well as when free.

Established within reach of the tourist, the ranch would prove so attractive that the fees from visitors would pay all expenses, and the object lesson to our people would be valuable beyond words. The ostrich is strange and profitable, but by no means beautiful—the cranes and herons are beautiful, and as soon as thoroughly domesticated could be sold for good prices as "ornaments to lawns."

We hope the Audubon Society and naturalists throughout the country will take up the idea in the interests of science and join in the only practicable plan yet offered to save many species of our birds from the extermination that is already plainly in sight. Appeal to the pocket nerve and find a blessing in the demand of fashion instead of vainly denouncing it as a cruelty and a curse. There is always a good side if we can find it.

Boston Transcript

SATURDAY, JANUARY 30, 1904

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At the same time that our study of nature has become so general, a so-called American life so common that the February Century takes for a text the current jest that the next outdoor manual is to be entitled "How to Tell the Animals from the Wildflowers," a danger threatens that study which the Zoological Society Bulletin of New York speaks of with a kind of despair—the automatic shotgun. It denounces this new gun, which fires, ejects the dead shells, and reloads in response to one pull of the trigger, as easily the worst of the forces at work in the progressive extermination of all American birds. With this instrument of uninterrupted slaughter the skillful market hunter or sportsman can wipe out an entire covey in the same number of seconds that are now required for the discharge of the "right and left." Although the game birds and animals of this continent have diminished at an alarming rate, the number of shooters and the

efficiency of their firearms have increased even more rapidly. And the logical conclusion of the whole business, as the Zoological Society sees it, is that if we don't wish to see our feathered folk and small game entirely wiped out—lost to the air and fields and trees, our springtime become songless and the woods emptied of "hairy citizens"—we must help hasten on the day, as this automatic gun certainly does, "when this State and all the States will prohibit the use of lethal weapons, exactly as carrying of pistols, common throughout the country fifty years since, has been stopped with the entire approval of the public. In less than a generation the day will have passed when the American can wander at large, over the landscape slaying all living things that will. There perhaps some remnants of our game may be allowed to live in peace."

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My Dear Listener—Having been the witness of a very unusual electric (?) phenomenon, I wish to send you an account of it, lest, owing to the hour of its occurrence, 2.45 A. M. today, it should have escaped the attention of those who keep you posted on such matters.

My attention was attracted by a flashing of light in the crack beside the window-shade, and I looked out to see whether a thunderstorm was in progress. The sky was clear and from the horizon there flashed lights, first in one place, then in another, the centre of the disturbance being in the southwest. The south to east was quiet, the north less active than the southwest.

At that hour Lexington is guileless of street lights and the suburban electric car is at rest. The flashing lights lighted several of the arc lights on the street. It was altogether a very strange experience and one quite worth an hour's watching in the night. I can give no idea of the duration of the phenomenon. M. P. C.

Lexington, Jan. 27.

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A curious effect of the long-continued severe cold of the present winter is noticed on a group of three large trees on Walnut street, in Brookline. Running from base to top of each tree, a height of nearly fifty feet, there appears a continuous split nearly a foot in depth, each crack facing to the northwest. The effect is like a triple stroke of lightning, which has opened each tree to the heart, and one wonders if the exposure will not injure the growth of the trees in the coming spring. Jan. 30, 1904.

SAVE THE STARVING WILD BIRDS

To the Editor of the Transcript:

The Audubon Societies have already explained to the public through your columns the great mortality among the birds due to the unusual severity of the weather over the greater part of the country. I am in a position to know that in spite of the splendid efforts being made in certain localities, to save the birds by feeding them, the mortality still continues, and I am writing, not only to call attention to this fact, but to urge bird-lovers and kindly-hearted people everywhere to do something, if ever so little to assist in checking this mortality. As the Audubon Societies have pointed out, birds can stand the most severe weather if they have but a sufficient supply of food to keep up the natural heat of their bodies. They are now quite unable to get this food. The deep snow has cut off the supply of the seed-eating birds, by covering not only the ground but the seed-bearing weeds, and the sleet and snow, by enveloping the trees in a sheathing of ice, prevent other species from securing the insects, insects' eggs and larvae, which ordinarily afford them an abundant supply of food. In order to save them therefore, other food must be supplied by the people, and at once. The best way to accomplish the desired result in any town, is to seek the cooperation of the schools, high schools and colleges, and this will seldom be refused if those in authority are applied to in a reasonable way. In this town for example—the case was explained to the superintendent of schools, and as a result, forty students of the High School volunteered their services in the distribution of different kinds of bird food on the following day. They were joined in the work by ministers and other professional men, and by such other citizens as could afford an hour or more during the afternoon. Many who could not go in person, sent quantities of grain, bird seed, suet, and other foods, and some sent conveyances to carry the boys who were assigned to long or distant routes. The relief party was divided into squads of two or three men each, each squad being provided with a supply of grain, several pounds of suet and at least one snow shovel. The suet was tied so securely to the trunks and branches of trees in and about the town, and the grain was scattered chiefly in fields and other wide open places. But wherever it was scattered, the snow was first cleared entirely away for a space of several yards, otherwise it would have sunk in at the first thaw, and been as useless to the starving birds as though it had not existed. The food was covered by a snowfall during the night, but the boys went at it again the next day, and they will continue to go at it until the weather breaks and the snow melts away, and until all danger of the birds dying of starvation is over.

ERNEST HAROLD DAYNES

Stoneham, Mass., Jan. 29.

Jan. 30/04.
Boston Transcript

Boston Transcript

WEDNESDAY, FEBRUARY 3, 1904

Dear Listener—It occurred to me suddenly the other day in viewing a collection of birds in cages, that those beautiful, innocent birds are serving, like many human prisoners, life sentences, solely because they are beautiful. Very much has been written about the sin of sacrificing birds for millinery purposes, but very seldom, if ever, is a word uttered in protest against imprisoning the dear little songsters. The inborn inconsistencies of the human race! Here is one instance I have in mind: The wife of a clergyman wears hats that are as free from the plumage of birds as a Quaker's. No one could induce her to wear a feather or a wing; yet recently before going away for a few days, she intrusted to the care of her nurse girl a pretty, active canary. The girl's attention was given to other things, and the poor bird was entirely forgotten. As the result of its having nothing to eat or drink for three days, its little spirit took its flight. When the lady returned home and was told what had happened, she remarked with surprising indifference: "O well, the poor little thing would not have lived very much longer anyway; it was getting pretty old. However, Ethel will be given a young bird for a Christmas present." The following lines fully express a bird's thoughts after being put

BEHIND THE BARS

I wonder what my wings were made for—
Flutt'ring, active, restless things;
And if this cage is all of bird-land,
Tell me why the bird has wings?

Shaking, hopping, waiting, restive,
How I long for once to fly;
Oh, how my aching pinions tremble!
Give me life, or let me die.

Else what can my wings be good for,
I as well might be a mouse,
As linger here a lonely prisoner,
Barred forever in the house.

Yonder in the deep green cedar,
Fair as light, and light as air,
Loud shouts the loving, joyous robin—
If you love me, send me there.

Oh, better anything with freedom,
Than to know that one has wings,
And must forever keep them fettered—
Thralldom hath a thousand stings.

Oh, this cage, it does not fit me;
I 'm not made for it, I know!
But mine is yonder azure heaven—
If you love me, let me go.

I. G. S.

+ + +

"It is so self-evident," writes W. Sloane Kennedy from Belmont, "that the winter birds are having a hard time of it—the deep snows covering the weeds that supply most of their seed-food—that it will be superfluous to give a hint to students of birds about scattering grain and food for them. But there are many younger and older folk that don't realize the situation. To such it may be well to say: Keep the snow shovelled down to the ground in some corner of your place and regularly supply cornmeal (how the juncos and sparrows do like this), or fine cracked grains of any kind. A plan I have followed this winter is to turn a lidless box on its edge and put food in it. The snow does not enter, and even when deep snows are on the ground, your box is a snug, warm inn for the birds to enter and breakfast. I know at least four or five families in my neighborhood who are regularly feeding birds (by tying up suet, etc.). The pleasure and companion-

ship one gets in watching the creatures, more than repay one, even if the interests of horticulture did not make it self-interest to keep the birds alive. I have felt some compunctions in daily feeding six robber jays all winter, but concluded they were good imperialists, and only in the fashion. They take kitchen scraps, corn, anything at all eatable. I hear that the poor gulls have perished by the hundred on the icebound seashore, and I never saw the crows so tamed by hunger."

+ + +

Dear Listener—Your correspondent of the 30th, H. W. W., mentioned having seen a snowbunting on the 23d of January. On the 22d, I had the pleasure of seeing four of them, on my window sill. On the 30th, a downy woodpecker appeared on one of my trees, and also three nuthatches. Blue jays have been with us all winter, and seemed willing to accept even bread as food.

V. A. A.

Roxbury, Jan. 31.

+ + +

* Dear Listener—Your West Medford and Boston correspondents, L. C. and H. W. W., who have recorded the presence of the hermit thrush about Boston in winter, will doubtless be interested to hear of two further records. A hermit thrush was seen on Jan. 1 in the morning at Hall's Pond, Longwood. It was plump and active, hopping about in a thicket of brambles, tilting its tail and uttering its characteristic "chuck." Another hermit thrush was seen on Jan. 8 at Chestnut Hill. This bird was likewise plump and active, and seemed in a perfectly healthy condition. From so many records, it is evident that the hermit thrush is wintering not at all uncommonly with us this severe season.

F. G. B. and M. C. B.

Brookline, Feb. 2.

1789
Nov 9

forenoon passed over Jeffry's ledge, saw a number of gulls of various kinds, flocks of white-winged coots black coots Shell Ducks and flock of Sea or Eider -down Ducks.

Nov 11

This morn at sun rise up with Boston Light House Nantasket Islands &c very beautiful and considerable verdure, sheep &c, very fine serene clear morning great quantities of wild Fowl particularly on the spit of sand, such as Shags Sea Ducks, Gulls Coots, Old wives &c Brant &c

1790

March 3 As we passed through little Cambridge towards Brookline saw for the first time this season a great many Robins (for a mile or two on the south side of a long hill. They are birds common in this country of a dark leaden color on the back wings and tail and red red breasts yellow white bills, and about the size of the english singing black bird. This is probably the red breasted thrush mentioned in Peter Kalm's Travels in N America.

April 6

wild Pidgeons brought to market the 3rd and to the 10th

May 18

The birds here called Boblimcums appeared in considerable numbers, Swallows have been numerous near the whole of this month Brent have been very numerous this Spring came earlier than usual.

July 14

Being shooting on Deer Island, I shot and wounded a Golden UpI and Plover, some little time after pursuing it I found it with a young one just fledged and beginning to flutter along the shore, upon attempting to catch it, it ran into the water and attempted to swim from the shore. I caught it and brought it home and was surprised to find it the next day apparently well and lively, I offered it young Grasshoppers worms and insects which ~~which~~ it caught at and ate them, appearing to be pleased with them, but did not like to feed out of the vessel which had water in it.

July 21

West Sudbury here saw several Passenger Wild Pidgeon

July 23

stage to N.Y. Weathersfield put up a couple of wild Pidgeons and a number of Red Shanks or Yellow Legs about a fenny pool

*From the diary of the ^{great} grandfather of
W. A. Jeffries who read these
notes at the Hunt Club meeting
on April 19, 1904. He presented
the notes to me - W. A. Jeffries.*

SOME NOVA SCOTIA BIRDS.

BY SPENCER TROTTER.

THE peninsula of Nova Scotia has a ragged coast-line; the land is deeply invaded by the sea through many fiord-like inlets. Four rocky headlands, scarred and worn, alternate with stretches of sand and shingle; boulder-strewn ledges fringe the shores and submarine banks reach far seaward. These sands seem to have impressed the early French explorers who gave the name "Sable" to the southern cape of the peninsula, as well as to a river and also to a group of low islands which lie at some distance off the eastern coast. The edge of the great Atlantic fog bank hovers over these shores, and creeping in with the southerly wind wraps the land in its gloomy mists, often for days at a time.

Back of this coast the voyager along the southern shores sees a land of pointed trees — spruce and balsam fir — rising into a low ridge that is succeeded inland by other similar ridges; a vast, unbroken stretch of evergreen wilderness from shore to shore

old clearings a profusion of wild strawberries were slowly ripening. The white flowers of the bunchberry (*Cornus canadensis*), the chickweed wintergreen (*Trientalis*), and the two-leaved solomon's seal (*Unifolium*) showed everywhere through the woods. The undergrowth of this region, except where dense forests of balsam fir had excluded sunlight, was for the most part made up of brake (*Pteris*), bayberry (*Myrica*), sheep laurel (*Kalmia angustifolia*), and blueberry bushes (*Vaccinium canadense* and *V. pennsylvanicum*).

across the peninsula, with wide savannas of sphagnum bog, swampy jungles of alder and tamarack, rocky 'barrens' covered by a growth of dwarf blueberry, and here and there, in the hollows between the ridges, the waters of a glacial lake. Many streams head in the bogs on the low divides, their waters dark with the leachings of the peat, and flow west toward the Bay of Fundy and east into the long inlets of the Atlantic. They widen out into lily-covered ponds where the moose wades and feeds, and in places the ancient building of the beaver has blocked their course with meadows. Each spring the salmon, running up from the ocean to spawn, stem the rapids of these rivers and leap their waterfalls, and the angler will find the brook trout from the foam flecked pools of the lower reaches to the head streams far back in the bogs.

Along the shores of the bays are the scattered settlements of a fishing folk, hemmed in landward by the wilderness of evergreens. At one of these — the village of Barrington, just back of Cape Sable Island — I spent the past three summers. It was mid-June when we reached there and lilacs and horsechestnuts were in bloom in the dooryards; a week or so later the air was sweet with the blossoms of the May or English hawthorn, hedges of which had been planted about some of the old houses. This renewal of the spring was very pleasing to us who had come from the early summer of southeastern Pennsylvania. Back in the woods we traced the footprints of spring where the dainty twin flower (*Linnaea*) showed in patches of faint rosy bloom above the moss. The dense thickets of Labrador tea (*Ledum*) and Rhodora, that grew along the boggy waysides, were in blossom, and here and there the chokeberry (*Prunus virginiana*) showed its flowers. In old clearings a profusion of wild strawberries were slowly ripening. The white flowers of the bunchberry (*Cornus canadensis*), the chickweed wintergreen (*Trientalis*), and the two-leaved solomon's seal (*Unifolium*) showed everywhere through the woods. The undergrowth of this region, except where dense forests of balsam fir had excluded sunlight, was for the most part made up of brake (*Pteris*), bayberry (*Myrica*), sheep laurel (*Kalmia angustifolia*), and blueberry bushes (*Vaccinium canadense* and *V. pennsylvanicum*).

During these June days and through the first half of July the land was ringing with bird songs. Along the village highway, from every piece of garden shrubbery, every patch of swamp tangle and thicket came the sweet, homely notes of Song Sparrows, Maryland Yellow-throats, and Summer Warblers. In the woods back of the village the loud, clear whistle of the White-throated Sparrow, calling *Old Sam Peabody-Peabody-Peabody*, struck the keynote of all that was wild and delectable in these solitudes. The song of the Olive-backed Thrush sounded far and near over the tree tops and across clearings, while from all about the woods came the dry, monotonous ditty of the Black-throated Green Warbler. These three songs were the dominant notes of the woodland. This is far from saying that other bird notes were not appreciably present to the attentive ear. The rapid chipping song of the Junco, the tiny tin trumpet of the Canada Nuthatch, the wiry notes of the Hudsonian Chickadee, the screeching calls of wandering Whiskey Jacks, to say nothing of the more familiar notes of Robins, Flickers, and Crows, all these and others fell upon the ear with more or less frequency, but back in the woods from dawn to sunset, you were rarely if ever out of hearing of some Peabody song, some Olive-backed Thrush, or some member of the ubiquitous and tireless tribe of Vireos.

For several reasons I have not attempted to present the birds of this interesting region in the form of a list of species. In the first place I was only a casual observer of the birds during three summers and only an indifferent collector during my third and last sojourn. In the second place the bird fauna of the region is already well known, and a list at the hands of one who took life easy would necessarily be imperfect. What I have tried to do is to record my impressions of the bird life as a whole and what facts fell in my way that related to certain birds in particular.

The shores of Barrington Bay are largely tide-washed beaches of coarse gravel, loose rocks, and boulders covered with brown rock weed. The ebbing tide lays bare extensive 'flats' of eel grass and exposes numerous ledges on which many harbor seals gather to sun themselves. Here and there a bar of sand affords a haunt for the restless flocks of shore birds, while the Herring Gulls and the Terns settle in long rows on these sand strips at

low water, their white breasts glistening in the sunlight. While at Barrington I saw an occasional Black-backed Gull. Some years before (1897) I visited a gull rookery at Cape Split where the waters of the Bay of Fundy spread into the Basin of Minas, a point much farther north than Barrington. Here the 'Coffin-carrier' was quite abundant and nested in the colonies of Herring Gulls on the narrow basaltic edges of the high Cape wall. In the clefts and crannies of this rocky wall many wild roses were in bloom which added a charming effect to the scene. I saw the two species feeding together; a number of gulls would swim in a wide circle, apparently 'rounding up' their prey, while several individuals in the center were actively engaged in diving after the fish. When seemingly satisfied the divers would drop back into the circle of swimmers and others would take their turn at diving and feeding. As far as I have been able to learn this rookery at Cape Split is one of the most southerly breeding places of the great Black-backed Gull, which is at home with the Ice Gulls and Kittiwakes of Baffin Bay.

The terns, or 'Mackerel Gulls,' as they are called by the fishermen, are reasonably abundant in Barrington Bay and probably breed on the shingle and sand beaches of Cape Island. All that I saw appeared to belong to the common species—Wilson's Tern.

The Black Duck was the only species of its kind that bred in this part of Nova Scotia; its favorite nesting haunts were the bogs about lake shores and it was fairly abundant in these situations during the early part of the summer.

One of the most conspicuous inhabitants of the tidal marshes, that formed wide stretches of shore land in many places along the bay, was the Willet. These birds nest on the inland border of the marsh where the swampy undergrowth of woods met the salt grass. I had no success in finding nests and was probably too late in the season. Fully fledged young birds were about early in July; one of these was shot by my son with an air rifle. The old birds were noisy and vigilant until midsummer, when they disappeared from these haunts and in small flocks frequented the mud flats and beaches at low water. Earlier in the summer, as we tramped along the inner edge of the marsh, or skirted its outer edge in a boat, the shrill *pill-will-willet* call was sure to greet us; one or

more individuals would follow, hovering with dangling legs on broad, outstretched wing, close at hand, or perched on some stake or the top of a spruce tree, restless, uneasy, and vociferous until we had gotten well away from the devoted spot.

Certain birds were remarkable for their scarcity, though abundant enough in other sections of the country. I saw but few Chimney Swifts during my three visits; this is undoubtedly due to the fact that most of the chimneys are small and are more or less continually in use during the summer. The Kingbird, save in one instance, was not observed about Barrington until the latter part of the summer when it appeared sparingly in old fields bordering the salt marshes and shores. In the extensive apple orchards about the Basin of Minas I found these birds nesting in 1897 — and they were fairly abundant. The majority of the Kingbird population undoubtedly finds more congenial nesting sites in the agricultural portions of the Province, and the birds appear in the wilder tracts of the southern part only after the breeding season. The same observations are true of the Bobolink. I found this bird nesting abundantly in the lush grass meadows of the Habitant that flows through an old Acadian dyke into the Basin of Minas, but only saw one individual during my three summers' stay at Barrington; a male bird in changing plumage, which I secured on July 30, 1903.

The only flycatcher aside from the Kingbird that I found at Barrington was the Alder Flycatcher (*Empidonax traillii alnorum*). Most of the individuals seen were low down in the dense growth of alders along a sparsely traveled road. The solicitous actions of several of these birds on August 8 betrayed the nearness of young. They kept well out of sight, only occasionally revealing themselves on the edge of the alders and all the while uttering a succession of piping chirps.

A small colony of Rusty Grackles frequented the inner edge of a salt marsh and several individuals were seen on June 17, 1902, in a fresh bog on Barrington River.

I had read Bradford Torrey's account of his hunt after Ravens in the country about Highlands, among the mountains of western North Carolina. I spent two summers at Highlands, and like Mr. Torrey had no success in meeting with this interesting bird. But

fortune changed when I visited Nova Scotia. Under date of July 11, 1901, is the following entry in my note book: "On the beach of a small island [in Barrington Bay] saw four Ravens. They were feeding on the head of a sheep. First heard the 'croak,' then saw the four large birds slowly take wing and flop heavily across the bay toward the further shore." There was no mistaking the ominous croak for the caw of a Crow. At first we thought it was the hoarse bark of a seal on the outer reefs. The Ravens took a direction quite different from that which the Crows took when leaving this small island. The Crows were numerous all about the bay and would fly to the nearest point of the main land, but these Ravens steered for a wild tract of woodland on the farther side of the bay which I afterwards learned was known to be a haunt of the weird bird. During the following summer (1902) I again heard the Raven's croak, several times, from the heavily timbered ridges about the less frequented parts of Shelburne Harbor.

Some northern members of the finch family were at home in this evergreen wilderness; birds which, until my visits to Nova Scotia, I had never seen alive before. One of these was the Pine Grosbeak.

All that I had read and heard from those who had observed the bird during its occasional winter wanderings to more southern latitudes led me to believe that it was almost foolishly tame and unsuspicious. In its breeding grounds, however, I found it just the reverse. The bird was far oftener heard than seen, and always appeared shy. The clear, loud whistling song would sound for long distances over the woods and open savannas. Every little while during the day one or more of these birds would be singing from the top of some tall spruce or fir. After delivering its song for some time the bird, when undisturbed, would suddenly fly down into the dense cover of the woods, but if suspicious of an intruder into its haunts it would frequently fly a long distance from the spot. Like the Goldfinch, the Pine Siskin, the Cross-bills and others of its tribe, the Pine Grosbeak often utters its whistling notes while on the wing. At first I used to think of this song as resembling that of the Goldfinch, only of greater magnitude, but later I came to recognize a quality in it that was

strangely suggestive of the whistle of the Greater Yellowlegs (*Totanus melanoleucus*).

From time to time we would fall in with wandering flocks of Crossbills, the dipping flight and twittering notes on the wing calling to mind the Goldfinch. They appeared to be exceedingly irregular in their movements, disappearing from a locality for days at a time. In the summer of 1901 I saw them first on July 7, and after that more or less frequently during my stay of three months. I have seen those birds feeding in the public road like English Sparrows. The past summer (1903) I did not see or hear Crossbills until the 13th of August. After that they appeared irregularly. Many of the birds were young and a few individuals of the White-winged species were mixed in with the flocks. The birds seemed stupid in their tameness. I fired three or four times into a flock that had settled in a black spruce, the birds busy shelling the cones, without causing any disturbance to the majority, which continued to feed unconcernedly. These flocks are eminently restless, sweeping about over the tree tops with their constantly uttered *tweet-tweet*.

Another finch of exceedingly irregular distribution locally was the Pine Siskin. I frequently heard its canary-like song during the latter part of the summer of 1901 and saw the birds a number of times. In 1902 I saw several individuals on the 18th of June, but never afterwards. Last summer the bird was conspicuous by its absence in the neighborhood of Barrington, and was seen only once, in the early part of September.

The Purple Finch was fairly abundant and its rolling carol was one of the charming songs of these woodlands. At Bedford Basin, near Halifax, N. S., where I spent one summer, this bird frequented the neighborhood of houses, like its western cousin. I have seen two males almost within hand reach of my window trying to outrival each other in singing.

The Acadian Sharp-tailed Finch (*Ammodramus caudacutus subvirgatus*) was an inhabitant of the tidal marshes about Barrington. The bird's notes are like the noise made by sucking in through the teeth, a wet sound that savors of the oozy marsh.

During the first two summers I had my mind set on finding Lincoln's Sparrow. It was not until last summer, however, that I

came upon the bird. My wife and I had wandered far back in a boggy savanna after blueberries — the largest berries I think I have ever seen — and growing weary of picking I took up the gun and began poking along the edge of a dense clump of bushes. Presently a bird showed itself and on being shot proved to be a young male Lincoln's Sparrow. This was on August 29, and a day or two later I secured another young individual in the same locality. Whether the birds breed in this region I am not prepared to say. The two individuals secured, though evidently not long out of the nest, may have been migrants from farther North.

The Red-eyed and Solitary Vireos were the only two species of their kind that I found about Barrington. The Hudsonian Chickadee was common everywhere through the spruce and fir woods and the Black-capped Chickadee was also fairly abundant, though far less so than the Hudsonian species. Golden-crowned Kinglets were frequently heard all through the summer, and Red-breasted Nuthatches were about as common.

Among wood warblers the Black-throated Green, the Maryland Yellow-throat, the Myrtle, and the Black and Yellow were by far the most abundant; the Black and White Warbler and the Redstart were not uncommon. The Chestnut-sided and the Yellow Palm Warblers were also observed. The Oven-bird was oftener heard than seen, and one Wilson's Black-capped Warbler was taken toward the end of the summer. A pair of Nashville Warblers were seen on the edge of an alder and tamarack swamp on the 27th of July, and several others were heard at the same time; one male was secured.

The Cliff Swallows had established colonies under the eaves of a number of the barns in the village. On my first visit I noticed a rather odd departure in the housekeeping habits of the Tree Swallows. A pair of these birds had taken up their residence in a deserted Cliff Swallow's mud house on the lintel over a cottage door. Probably the Cliff Swallows found communal life more to their liking and deserted the solitary dwelling to join some nearby colony.

Young Robins, just out of the nest and not yet able to fly, were found on the 22nd of August, which struck me as rather a late date for Robin fledglings. One cause of these delayed broods is

probably the great abundance of berries in the late summer on which the young birds are fed.

The two species of the *Hylocichla* group of Thrushes which I found in this part of Nova Scotia, presented some interesting facts in local distribution. On the west side of Barrington Bay I found the Olive-backed Thrush the predominant species, while on the eastern side, the Hermit was the only one noticed. I cannot account for this on any other ground than the tendency of individuals of the same species to congregate in the same area. My observations lead me to believe that the Olive-backed Thrush is the shyer of the two. I saw the Hermit a number of times close to dwellings and it seemed to choose the more open woodland tracts, while the Olive-backed Thrush frequented the heavier growth along the edge of clearings. I have approached quite close to the Hermit and listened to his matchless song delivered from a fallen tree or stump in the clearings at noon-day, but the Olive-backed Thrush was always difficult to approach, and so far as my observations go, is a much wilder bird in its habits. Its favorite post when singing is near the top of some tall spruce or fir; the bird diving into the undergrowth on the slightest suspicion of an intruder.

The song of the Olive-backed Thrush seemed to me to be inferior to that of the Hermit; it starts out well but is finished in a series of squeaky notes. My ear for music, however, is uncultivated and I am told by those who have a good ear that the Olive-backed Thrush is really the better performer of the two. The Hermit's song appealed to me as a sustained melody throughout; as though the musician had the ear to appreciate as well as the power to express. Aside from their relative merits as musicians both birds are charming songsters, voicing the very spirit of wilderness solitudes.

The alarm notes of the two species are quite different. The Olive-backed Thrush when disturbed utters a metallic note, short and sharp, often ending in a curious rolling, querulous call. This note is uttered constantly while the bird is fidgeting about in the cover near by. I have several times mistaken these short *pucking* notes of the Olive-backed Thrush for the alarm calls of the Ruffed Grouse to her scattering brood. The alarm note of the Hermit has a Catbird quality about it, lower pitched and less

metallic than that of the Olive-backed Thrush. On the 10th of August I found a Hermit calling to her brood in the undergrowth with a low cluck that was instantly changed to the alarm note when my presence became known.

On the wooded slopes about Shelburne Harbor the Hermit Thrush was apparently abundant. In the hush of the long twilight we would drift far out toward the edge of burnished water, listening to the vesper strains of some late singer that came with infinite sweetness out of the gathering gloom of the farther shore.

Auk, XXI, Jan., 1904, p. 55-64.

Information derived from City Hall and
 J.D. Squire's establishment East Cambridge
 April 21, 1905 by Walter Deane

Boston Provision and Packing Company was the
 name of the slaughtering house on Concord Ave
 beyond Fitch Road.

The place was afterward taken by the
 Commonwealth Blue Company.

In at least ten years possibly fifteen, the
 Boston Provision and Packing Co. used their
 own private sewer connected with the
 Metropolitan Sewer which does not extend as
 far as the works. They stopped work about
 a year ago. The Commonwealth Blue Co.
 have been established in the block since
 July, 1904, using the same sewer.

So for 10-15 years no refuse matter has
 been drained from the block into the
 neighboring swamps.